The Iron Age

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Power Couplings for Rolling Mills and Other Machinery.

In an interesting paper on power couplings, by Messrs. F. W. Varley and Edward Furness, lately read before the British Iron and Steel Institute, we find the following, which is of interest to our readers:

There is not, as far as the authors of this paper are aware of, any clutch or coupling in use that comes under the name, or can be included in the title of a "power clutch," nor are they aware of any system in which direct power by means of a coupling is employed, in picking up shocks and strains, in either reversing, starting or stopping heavy rotating masses, such as rolling mills.

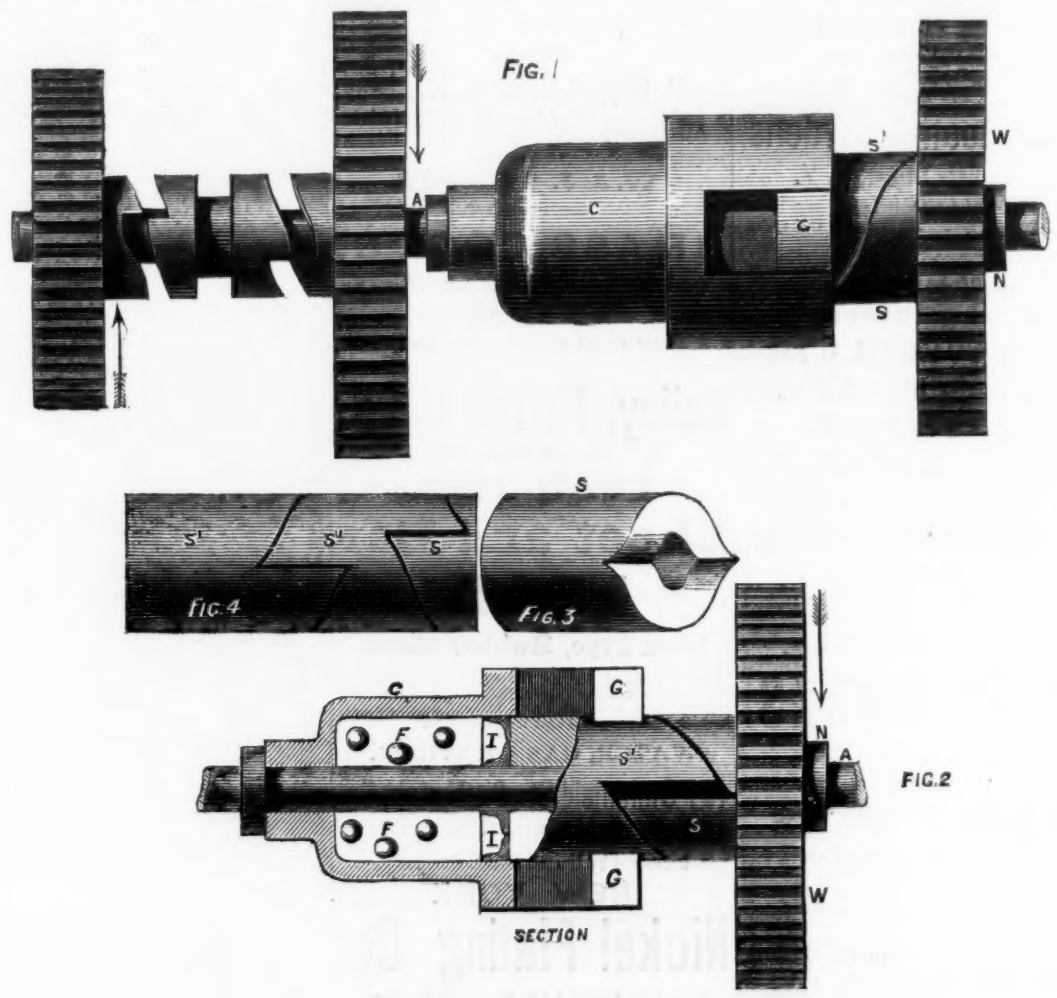
The object of this paper is to describe a means of controlling or reversing mills which receive their power from a continuously and uniformly driven shaft, where the fly-wheel picks up the accumulated momentum, and the shaft for all practical purposes may be considered to be driven at an uniform rate. To arrest a heavy body in motion it is necessary to exert a force equal to the dynamic effect of the weight of a body multiplied by the square of the velocity; if this is effected instantaneously a great concussion is the result; such being the effect when a piece of machinery in rapid rotation is suddenly arrested by clogging, causing the cogs of the wheels to be stripped off, or the shafts broken, this being a frequent occurrence with rolling or crushing mills, and applies generally to all machinery in motion, especially when subject to rapidly varying strains.

The frequent sudden shocks and strains which machinery of all kinds has to overcome, due to the momentum of the moving parts of the machines themselves and the sudden shocks of the varying work to be done, often causes breakages, which would not occur if these strains came gradually into action. For this reason machinery is often designed much heavier than is necessary, and so actually aggravating the evil, as when a heavy mass of machinery has to be got into motion previous to putting on the work, the power required at first is excessive, and afterward, as each portion of the machine gets into motion, such power required is reduced to that merely to overcome friction. But presuming such machinery is suddenly stopped, the strains will equal the accumulated force originally exerted to get the machinery into motion instantaneously, and each portion will then receive a blow proportionate to its weight multiplied by the square of its velocity.

It occurred to the authors of this paper that a means for arresting a rotating body in motion quickly, or altering the direction of rotation without a sudden shock, could be obtained by altering the direction of the force of such strains, and gradually controlling them by a spring or elastic force accumulator.

In rotary shafting this is accomplished as shown by diagrams, Figs. 1, 2, 3, 4, and illustrated by working model. Fig. 1 is an elevation showing the ordinary reversing gear for a shaft fitted with an hydraulic coupling for driving the wheel W. Fig. 2 is a section showing the interior of an hydraulic coupling; the wheel W, Figs. 1 and 2, with the screw-shaped boss S, is loose on the shaft A, the screw-shaped boss S acts against a similarly screw-faced cam S_1 at the end of the ram or piston working in an hydraulic cylinder C with the requisite packing I I between the ram and shaft and ram and cylinder; the circumference of the cylinder and the ram are concentric with the axis of the shaft A; the ram has lugs G G or projections on it which move freely in slots or recesses which allow the ram to glide into the cylinder but prevent it turning round in it. In the water of the hydraulic cylinder are placed India rubber balls or elastic air chambers F F. Upon motion being communicated to the shaft A in either direction of the arrows by the clutch, it causes the cylinder C and the ram S_1 to revolve together and drive the wheel W, by the screw-shaped faces acting against one another like the horns of a common fork clutch. Now, should there arise any sudden strain on the wheel W, the shaft A and the attachments to it will not receive the shock but will continue to rotate, and the screw shaped face S_1 of the ram acting on the similarly screw-shaped boss S of the wheel, will force the ram into the cylinder C and compress the elastic material placed in the water, which will spread the force of the blow over a period of time and destroy its intensity, and when an equilibrium of power is established, the ram S_1 will resume its original position by the screws gliding back over one another in proportion as the strain is reduced. It is preferred to make the pitch of the screws wide, or the inclination so rapid that the elastic material may be able to overcome the resistance the better in forcing back the ram to its original position, and for the reason, the nearer the faces of the screws are parallel to the axis of rotation, the better they will act in communicating the rotary motion to the shaft to be driven. The action of the coupling may be briefly described thus: The screw-shaped faces S and S_1 act against one another as a common fork clutch, and when the shaft A is in motion it carries round with it the cylinder, ram and wheel; now, if the wheel be retarded the shaft will continue to rotate, but in so doing forces the ram into the cylinder until the elastic material is compressed with a force equal to the resistance opposing the rotation of the wheel; when the obstacle is passed the pressure in the cylinder will be in excess of the work then doing, this accumulated pressure will be given out again and bring the wheel W, which drives the mill, quickly to its original speed, and this is effected as gradually as the shock of the stoppage had been previously relieved by the form of the screw faces S and S_1, so that as a practical result there is neither concussion nor sudden strain either in stopping or reversing.

Figs. 3 and 4 show forms of right and left-handed screws combined, which can be used for forcing the ram into the cylinder, supposing the shaft to be driven in either direction.



POWER COUPLINGS FOR ROLLING MILLS.

Hitherto plans have been advanced for the purpose of arresting and reversing rolling mills by means of friction clutches. Friction clutches are always liable to slip or seize, and the authors contend that they require a considerable amount of force to keep the friction surfaces in contact; they are continually wearing out by attrition, and consume much useful power in arresting the momentum of machinery, which power is consumed in generating heat or tearing off the frictional surfaces. This waste of power, the authors submits, will be entirely obviated by the use of this form of coupling; moreover, the exceeding simplicity of construction, and considering the facility and readiness with which the coupling can be adapted to existing rolling mills without necessitating expensive alterations or derangement of existing plant, it becomes a matter more of practical trial and experiment than one of cost, more especially when we consider the many and important uses to which a good coupling can be applied. If in this respect the authors have been able to solve a problem of so vast a commercial importance, and have in any way contributed to set at rest a subject which has been a continual source of anxiety and trouble to engineers, they will feel themselves amply awarded.

File Cutting Machinery.—Dr. G. Haseltine, of Southampton-buildings, London, has taken out a patent for machinery for cutting files. The invention relates to a file cutting machine in which a bed is used that rests directly upon the feed screw, the said screw being of sufficient strength to support the bed while the file is cut. The feed-motion of the screw is produced by a ratchet wheel and pawl, and with these parts is combined a spring which acts on the cover of the journal box, at one end of the feed screw, the cover being supported by an eccentric. The bed is saddle shaped, and with it is combined a frame with parallel motion links, for the purpose of lifting the bed out of gear with the feed screw. This bed is provided with a cavity to receive a semi-cylindrical secondary bed, and with these two beds is combined a gauge, which bears on the secondary bed and maintains the surface of the file blank parallel with the edge of the cutter, The file blank is retained on the secondary bed by clamping jaws and a spring. The stock which carries the cutting tool moves between guides or slides, which can be set to insure accuracy in the movement of the cutter. The tool stock is operated by compressed air.

Steel Making In Westphalia.

Herr Gruner, in his report on mineral industries, gives the following account of the principal steel works of Westphalia: The establishment of Herr Krupp is the most important in Westphalia, and possesses eleven blast furnaces on the banks of the Rhine, producing annually about 120,000 tons of pig iron. The steel works of Essen alone employ 12,000 men, and produced in 1872 125,000 tons of cast steel. The most notable products of this establishment, and which are well known to the world, are the monster guns, one of which, shown at Vienna, weighed 36 6-10 tons, and is capable of throwing shells of 296 kilos., with a charge of 60 kilos. of powder; but guns of all sizes are produced by Herr Krupp, down to the mountain howitzer of 2 cwt. Beside cannon, axles, tires, piston rods, straight and crank shafts for marine engines are produced in large numbers, and almost all from crucible steel. Cast steel axles for railway carriages have been adopted in Germany for a dozen years. In 1872 Herr Krupp supplied 1600 such axles. The tires are always made from discs of the cast metal pierced in the center, enlarged by means of the hammer, and then rolled annularly; 45,000 of these were turned out at Essen in 1872. On account of the purity of the material, and the means employed in their manufacture, cast steel is much more generally used for axles and tires in Germany than in France. Steel, in fact, only gives entire security providing it is pure; here lies the principal secret of the success of the Essen Works. Amongst the products of Herr Krupp was a marine engine shaft with crank 7·65 meters long, 0·38 meter in diameter, and weighing 9 tons; a dozen pairs of small rolls for the use of mints, gold and silversmiths, and percussion cap makers, polished to extreme perfection; and an enormous block of cast steel, formed by means of a 50 ton steam hammer into an eight-sided prism.

This mode of fabrication is generally adopted at the Essen Works; whatever is to be the form desired, all the ingots are cast cylindrical and formed into prisms, generally octagonal, before being rolled. It is evident that a cylindrical ingot is more homogeneous from circumference to center than any polygonal ingot. Cylindrical ingots are almost unknown in France, but Herr Gruner is of opinion that they ought to be adopted to the entire exclusion of the less rational rectangular or hexagonal forms. In 1851 Herr Krupp showed at the Great Exhibition a block of cast steel weighing 2¼ tons; at the Paris Exhibition of 1855, one of 10 tons; in London in 1862, one of 20 tons; in 1867, one of 50 tons; and in Vienna in 1873, one of 52½ tons. Since the last Paris Exhibition Herr Krupp, like other proprietors of steel works, has made Bessemer steel rails. In 1872 the production of rails amounted to 50,000 tons. For these rails also the ingots are cast cylindrical, and transformed by the hammer in octagonal prisms, as described above; but, in order to save waste and to produce sounder rails, the system was adopted of casting large ingots, which, after being hammered into prisms, were cut into the several pieces of sizes required. These rail ingots are often three tons in weight. The same plan is adopted in the case of tire making. This is another of the Essen processes which Herr Gruner thinks should be adopted generally.

The next most important steel works in Westphalia are those of the Bochum Company, which employs 5000 men, and produced 48,000 tons in 1872, but which total has been much surpassed since. At the Bochum Works the system of molding objects in cast steel is said to have originated; and bells, solid railway carriage wheels, and toothed wheels for machinery are produced there to the extent of 7000 tons per annum. Cast steel cannon with forged steel rings, tires, &c., are also made at Bochum, as rails are produced at Essen, from large ingots cut or sawn into the sizes required.

Other steel works exist at Annen and Witten, the latter producing fine sheet steel and cannon. It is lamentable that so large a portion of the cast steel of Prussia is used in the production of murderous arms.

A Famous Old Ship.—The ship Horatio, belonging to New Bedford, was burnt in the harbor of Shanghae, December 15th. She was a remarkable vessel, and had attained the unusual age (for a ship) of 42 years. Her architecture was a marvel to contemplate. She was built of live oak, copper-fastened, and was constructed so solidly and of such ponderous frame that, although registering but 460 tons, her frame was as large as that of a 1200 ton ship of the present day. Her career has been one of great success and profit for her owners. She never was obliged to put into port for repairs, was never dismasted, and never made a claim on the underwriters for damage to cargo. She had been build for, and was always engaged in, the East India and China trade. Notwithstanding her extreme old age, she rated A 1 until burnt; and it is estimated that her owners and the owners of cargoes shipped in her have paid insurance companies $500,000 for premiums during her career. In her early life, before steamship lines were established, she was a favorite passenger vessel. On one occasion, an infant was born on board of her, and the child, who has since grown to womenhood and become a mother, visited the Horatio when she was last in the port of New York. The strength and massiveness of the timbers with which this old ship was built were ultimately one of the causes of her destruction. When the fire broke out, she was towed from her berth to be scuttled, and the launch of the American man-of-war Hartford, then at Shanghae, fired a number of 12-pound shot at her near the water line, to make a passage for the water. A number of men were then sent to enlarge the openings which the shot might make—but so little impression could be produced upon the heavy frame that, after an hour's hard work, the attempt was abandoned. She could not be sunk—and burnt to the water's edge.

The Engines of the Reading Railroad.

The Philadelphia and Reading Railroad Company own 405 railroad engines or locomotives, of which 351 are in daily use, 26 in work shops under repairs, 16 in good order ready for use, and 12 out of service, to be re-built. Of these locomotives 298 were made at the company's shops, Reading; 29 by M. Baird & Co., Philadelphia; 26 by Baldwin, Philadelphia; 20 by Norris Brothers, Lancaster; 7 by Norris & Son, Philadelphia; 5 by Rogers' Locomotive Works New Jersey; 4 by Locks and Canals Company, Massachusetts; 4 by Brandt, Lancaster; 3 by Mine Hill Railroad, Cressona; 2 by Little Schuylkill Railroad, Tamaqua; 2 by Braithwaite & Co., London; 2 by Boston Locomotive Works; 1 by Smith & Jackson; 1 by S. & S. R. R., Ransch Gap; and 1 by New Castle Company. The oldest two engines owned by the company, are Nos. 1 and 2, built by Braithwaite & Co., London. They were put on the road in March and May, 1838. They are now at work at Richmond. These are third-class engines, weighing about 12 tons each. The next oldest engine is No. 4, of the second-class, which ran first in November, 1842. She is now assorting cars at Schuylkill Haven. The heaviest engine on the road is No. 198, which weighs 37·6 tons. It was run first in July, 1868, and is now in the coal trade, on the Mahanoy and Shamokin Branch. The lightest engine is the Alpha, fourth-class, which weighs 8·3 tons. She is in order at Reading. Beside the Alpha there are five engines of the fourth-class, the Ariel, Gem, Stag, Transit and Witch. Of these the Stag is the heaviest, weighing 14·6 tons. The Stag is also the oldest of this class, having run first in February, 1851. She has also run more miles than any other engine of her class, having made 355,409 miles, to 241,550 by the Witch, the next in number. Engine No. 49, which first ran in August, 1857, has run further than any engine on the road, having made 475,733 miles to 455,423 made by No. 58. No. 40 is at passenger work on the Germantown and Norristown Branch. The engines which came next in number of miles are No. 44, 438,541 miles; No. 57, 426,071 miles; No. 45, 423,222 miles; No. 23, 410,733 miles, and No. 31, 409,622 miles. The engine which has run fewer miles than any other is No. 365, which has only made 1292 miles. This engine was run first in November, 1872, and is now out of service, to be rebuilt.

The total number of miles run by all the engines of the P. & R. R. R. in 1874 was 8,119,077. Total number of tons hauled one mile on main road and branches in 1874, 1,583,363,935. Cost of repairs of engines in 1874, $476,246. Total number of miles run by all engines of company from May, 1838, to November 30, 1874, 91,925,904. Total number of tons hauled one mile, between same dates, 30,964,618,879.

In Paris, the watchmen in all magazines where inflammable or explosive materials are stored, use for purposes of illumination a light provided according to the following method: Take an oblong vial of the cleanest glass; put into it a piece of phosphorus about the size of a pea, upon which pour some olive oil heated to the boiling point, filling the vial about one-third full, and then close the vial with a tight cork. To use it, remove the cork, and allow the air to enter the vial, and then recork it. The whole empty space in the bottle will then become luminous, and the light obtained will be equal to that of a lamp. As soon as the light grows weak, its power can be increased by opening the vial and allowing a fresh supply of air to enter. In winter it is sometimes necessary to heat the vial between the hands to increase the fluidity of the oil. Thus prepared, the vial may be used for six months.

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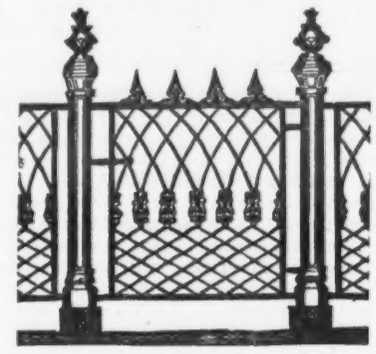

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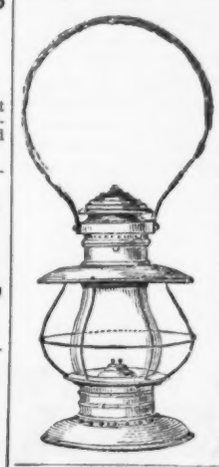

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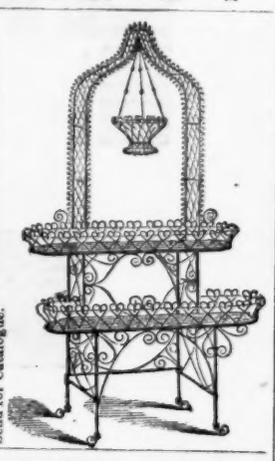

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The art consists, therefore, of two principal points. First, so to proportion the original size and thickness of the metal disks, that it shall exactly suffice for the production of the required object—neither with excess of metal, which would have to be cut off with shears and thrown aside, wasting a part both of the metal and labor, nor with deficiency of metal, which would be nearly a total loss. Secondly, that the work shall be produced with the *smallest possible number of blows*, which sometimes tend to thin, and at other times to

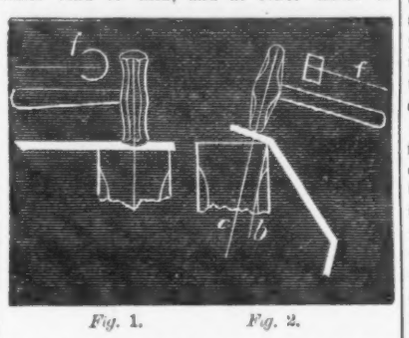

Fig. 1. *Fig.* 2.

thicken, the metal; whereas, the finished works should present a uniform thickness throughout, and which is, in many cases, just that of the original metal when in the sheet.

For instance, a hollow ball six inches diameter is made of two circular pieces of copper, each 7¼ inches diameter. Now, calling the original circumference of the disk 22¾ inches, this line eventually becomes contracted to 18 inches, or the circumference of the ball, although, at the same time, the original diameter of the disk, namely, a line of 7¼ inches, has become stretched to that of 9 inches, or the girth of the hemisphere.

This double change of dimensions, accomplished by the malleability or gliding of the metal, occurs in a still more striking manner in the illustration of spinning the tea-pot, in which the disk, originally about one foot diameter, becomes contracted to two or three inches only at the mouth.

The first and most important notion to be conveyed in reference to raising works with the hammer, is the difference between those which may be called opposed, or solid blows, that have the effect of stretching or thinning the metal; and those which may be called unopposed, or hollow blows, that have less effect in thinning than in bending the metal; in fact, it often becomes thickened by hollow blows, as will be shown.

For example, the hammer in Fig. 1 is directly opposed to the face of the anvil or meets it face to face, and would be said to give a solid blow; one which would not jar the hand grasping the plate, were the latter ever so thick or rigid; and this blow would thin the metal by its sudden compression between two hard surfaces, the face of the hammer being represented at *f*.

The hammer in Fig. 2 is not directly opposed to the anvil, or rather to that point of it which

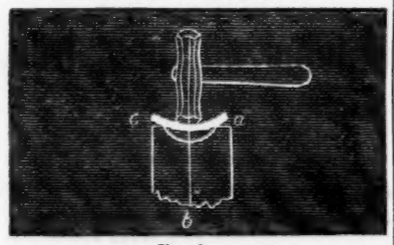

Fig. 3.

sustains the work, consequently this would be called a hollow blow, one which would jar the hand were the plate thick and rigid; and it would bend the plate partly to the form of a supporting edge. The hand situated at *a*, Fig. 2, would be insufficient to withstand the blows of the hammer at *c*, but for the great distance of *a b*, compared with *b c*, and the thin flexible nature of the material.

From these reasons the coppersmith and others never require tongs for holding the metal, the same as the blacksmith, except at fire, as in annealing and soldering. In hammering thin works, a constant change of position is required, and which can be in no way so readily accomplished as by the requisite mechanism given us by nature, the unassisted hand. When, however, the works are too rigid or too small to be thus held, the anvil is made to supply the two points *a c*, as in Fig. 3, and the blow of the hammer is directed between them.

We will now trace the effects of solid and hollow blows given partially on a disk of metal *a a*, Fig. 4, supposed to be 12 inches diameter; first within a central circle *c c*, of three inches diameter; and then around the margin *a b*, to the width of three inches, leaving the other portions untouched in each case; the thickness of the metal is greatly exaggerated to facilitate the explanation.

The solid blows within the circle *c c*, would thin and stretch that part of the metal, and make it of greater superficial extent; but the broad band of metal *a c*, would prevent it from expanding beyond its original diameter, and, therefore, the blows would make a central concavity, as in a cymbal, or like Fig. 5. And the more blows that were given, either inside the bulge upon a flat anvil, or outside the bulge upon anvil or head of a globular form, the more would the metal be raised, from its being thinned and extended; and thus it might be thrown into the shape of a lofty cone or sugar-loaf.

The hollow blows given within the same limited circle would also stretch the metal and drive it into the hollow tools employed, such as Fig. 3; thus producing the same effect as in Fig. 5, but by stretching the metal as we should the parchment of a drum, by the pressure of the hand in the center, or by a blow of the drum stick.

The solid blows around the three inch margin, would thin the metal and cause it to increase externally in diameter; but the plate would only continue flat, as in Fig. 6, if every part of the ring were stretched proportionately to its increased distance from its first position. Were the inner edge toward *b*, thinned beyond its due amount, its expansion, if resisted by the strength of the outer ring *a*, would throw part of the work into a curve, and depress the metal, not as in the cymbal, but in the form of a gutter as in Fig. 7; it would, however, more probably happen, that the inner edge alone of the marginal ring would be expanded, leaving the outer edge undisturbed, and producing the coned figure, Fig. 8.

The hollow blows given around the edge, as in Fig. 2, would have the effect of curling up or raising the edge, first as a saucer Fig 9, and then into a cylindrical form Fig. 10; provided that by the skillful management of the hammering, the metal could be made to slide upon itself without puckering so as to contract the original boundary circle of the disk or 12 inches, into six inches, or the measure of the edge of the cylinder resulting from the drawing in of the three inch margin.

In this process the metal would become proportionally thickened at the upper edge, because each little piece of the great circle, Fig. 11, when compressed into a circle of half the diameter, would only occupy half its original

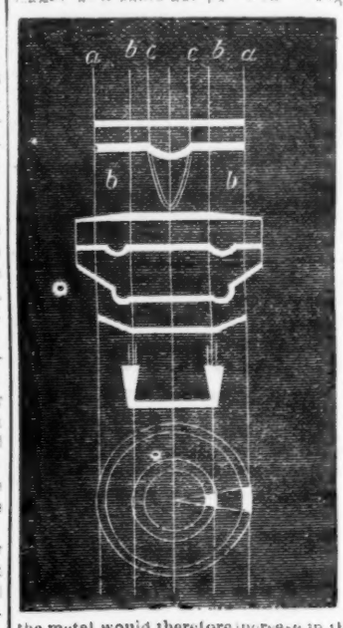

Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7.
Fig. 8.
Fig. 9.
Fig. 10
Fig. 11

the metal would therefore increase in thickness in a proportional degree. The remainder of the circle serves for the time as effectually to compress the metal in the direction of the tangent, as if the radii were the sides of an unyielding angular groove dotted in Fig. 11; this contraction produces in fact the same effect as the jumping, or upsetting, by endlong blows in smiths-work. Theoretically, the thickness of the upper edge of the cylinder would be doubled, and the lower edge would retain its original thickness, as in 14; whereas, in extending the margin of the disk by solid blows as in Fig. 6, the thinned edge would be found to taper away, also in a straight line, from the full thickness even to a feather edge if sufficiently continued, but neither of these cases would be admissable, as the general object is to retain a uniform substance.

In equalizing the thickness of the cylindrical tube, Fig. 10, the solid blows would thin the metal, but at the same time throw it into a larger circle, it would then require to be again driven inward, which would again slightly thicken it. So that in reducing the metal to uniformity, two distinct and opposite actions are going on; and upon the due alteration, combination, or proportioning of which will entirely depend the ultimate form; that is, whether the metal be allowed to continue as a cylinder; to expand or to contract, either as a cone or as a simple curve; or to serpentine in any arbitrary manner, according as the one or other action is allowed to predominate with the gradual development. The treatment of such works with the hammer is unlike spinning the teapot, at those parts of the work where the metal is folded down in close contact with the solid revolving mold therein employed; but in completing the upper part on the small block, the burnisher and the rubber may be considered equivalent to the two antagonist forces, which lead the hammered vessel inward or outward at the will of the operator.

This subject is too wide to enable anything more to be offered than a few general features, and I shall therefore proceed to trace briefly the practice in some examples.

[To be Continued.]

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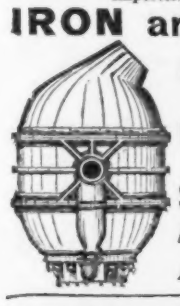
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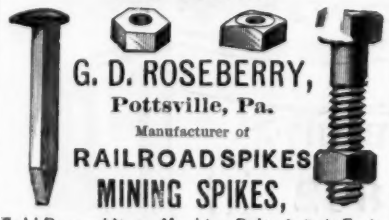
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On the Practical Objections to Reversing Rolling Mills for Plates, and a Proposed Substitute.

At a recent meeting of the Cleveland Institution of Engineers, Mr. Edward Hutchinson, of the Skerne Iron Works, Darlington, read a paper bearing the above named title. The following is the substance thereof:

It will, no doubt, be remembered that in his opening address last session, our then president pointed out in a most lucid manner the very intimate connection that exists between the science of engineering and certain other studies, both of a scientific and literary nature, which, as he very correctly said, form the essentials of a really good education, and without which success cannot be commanded or expected in any important sphere of usefulness. He called our attention to induction, or experimental philosophy, as one of the most important of these studies, and we learn from his remarks that all true engineers must be, either consciously or unconsciously, inductive philosophers, and that the more closely they study to follow the method of reasoning indicated, the greater, in all probability, will be their professional success.

Taking, then, this valuable lesson to heart, let us first endeavor to ascertain experimentally on what ground the supposed objections to reversing rolling mills are based; and having done our best to collect and consider all the facts bearing upon the case, we may then, with the light thus thrown upon the subject, proceed to discuss the best means for remedying the evils which we think we have found to exist. Now, in reviewing what has already been written and said on this subject, I think we shall find that hitherto a tendency to begin at the wrong end has, to a considerable extent, manifested itself. Instead of following the true Baconian method, and founding theories upon experience and facts, a great deal of trouble has been taken and much ingenuity expended in endeavoring to overcome evils the existence of which has pretty much been taken for granted. The consequence of this, I think, is, that the results have been of but little value, and at the present time, probably, the original plan of reversing machinery is doing as good or better work than any of its younger rivals.

In the presidential address I have mentioned, it was estimated that in the Dark Ages some 30,000 unfortunate women were, in this country alone, condemned to suffer a horrible death for the supposed crime of having sold themselves to the devil, while no one ever troubled himself to consider whether such a transaction was practicable or not, or whether a customer could be found in any case. I think we shall find something very like this in the question now under consideration. In reversing rolling mills, the fearful shock caused to the machinery by the process of reversing is the devil we have hitherto used our utmost endeavors to cast out; and to accomplish this supposed desirable end innumerable schemes, many of them more or less calculated to remove the evil, had it existed, have from time to time been proposed, adopted, and, it may be added, abandoned.

The question arises—and is capable, I think, of only one answer—Is the game worth the powder and shot? A due amount of consideration will, I think, convince us that the magnitude of this evil has been immensely exaggerated, or, at least, that there exist evils which merit a much greater share of attention from those interested in the engineering of iron works.

In a paper contributed by Mr. Jeremiah Head, to the Iron and Steel Institute, on an ingenious form of reversing crab, which had for one of its objects the elimination of shock, are to be found, perhaps, the only figures of any value—at least so far as my observation goes—at present before the public, calculated to throw any light upon this part of our subject. The writer of this paper has, beside ascertaining important facts as to the power expended in rolling plates, &c., also calculated the weight of the machinery suddenly put in motion by the reversing proceess. Having, however, thus far pursued the right method, an important link, as it seems to me, is wanting in his chain of arguments. Instead of pausing to consider what power is requisite to overcome suddenly the inertia of the parts at rest, and comparing this with the power expended in actually rolling a plate, the writer seems to jump to the conclusion that the shock must be so great as to merit prompt and special attention, and treats it as if it were, if not the only, at least the most important objection to reversing machinery.

Roughly speaking, we may take the weight of shafts, crabs, &c., suddenly put in motion, as from 8 to 10 tons in an ordinary sized plate mill; and if we take the mean diameter at 12 in., and the number of revolutions as 30 per minute, we have this weight suddenly put into motion at the speed of about a mile an hour. It will give us a pretty good idea of the shock thus caused to the machinery if we suppose two chaldron coal wagons, of the olden time, standing at rest, full of coals, upon a line of railway, and a locomotive, as heavy as you like, traveling at the reckless speed above indicated, coming into contact with them, buffer to buffer. If these shaky old vehicles stood the shock thus caused without any serious damage, I think we may safely trust our massive mill gearing to a similar treatment. In fact, I think we may, for all practical purposes, assume that the momentum of the spur wheel, which first comes into contact with the clutch, is alone sufficient to overcome the inertia of the parts at rest, and that no extra strain worth speaking of is caused to the other parts of the machinery, *i. e.*, the other spur wheels, engine, &c., by the reversing process. Any one may convince himself that the engine sustains no shock by watching the governor, which makes no sign on the application of the clutch, but which fails the moment a piece of iron is put through the rolls. It may be granted that the shock acts mischievously in shaking nuts and cottars loose, which may in turn lead to more serious damage; but this is a matter which may be remedied by simpler means than those which have been suggested, even if we grant that these would answer the purpose. My convictions on this head are fully borne out by observation and practice. I have seen many breakdowns in reversing mills, but they invariably occured in consequence of some accident or abnormal strain upon the machinery, while the iron was passing through the rolls, and I never knew of one which could be even indirectly traced to the effects of the shock caused by the reversing process. The teeth of the clutch themselves do not travel faster than about 180 ft. per minute, and any machinery liable to be damaged by the slight shock thus caused is totally unfit to stand even the normal strain caused by rolling an ordinary plate, but which strain is often enormously aggravated by unavoidable accidents. If, then, we do not allow that the shock difficulty is an insuperable objection to reversing rolling mills, or even a serious drawback thereto, in what respect is it found that mills with this appliance compare disadvantageously with those of the old kind? First, on account of their increased prime cost; secondly, on account of their multiplicity of parts, and their increased liability to derangement consequent thereupon; thirdly, on account of their increased cost in working. As the first and last objections are much more than counterbalanced by the increase in output, we may summarize our objections thus: The gearing is too heavy and complicated for its purpose; its character and surroundings are such as to render it particularly liable to derangement, and it is so constructed that an accident to any part not only causes a complete suspension of work, but frequently also extensive and costly repairs and great loss of time. We want something more simple, less liable to derangement, and, more especially, something in which a breakage or failure of any one part may be promptly remedied, and at less cost than at present is possible. Probably few mill owners or managers fully realize the cost of stoppages. If it were possible correctly to estimate it, I should not be surprised to find that, in times when an average profit is to be made on the manufacture of plates, standing on the Monday night shift is about equivalent to sinking half a week's profit, while it would perhaps be impossible to work at a profit a mill which never started till the Tuesday night. This, however, bears only indirectly on the subject.

Beside the objections to reversing rolling mills, as at present in use, there is another and special one, inseparable from the reversing action, *i. e.*, the double wear upon the bosses, spindles, &c., which do not in practice wear more than half as long as those in a mill revolving always in the same direction.

It is hardly worth while to describe in detail the various arrangements of wheels, shafting, &c., by means of which two spur wheels are made to revolve in opposite directions upon a shaft; and how motion is given to the shaft by means of a crab sliding between them, and engaging, by means of claw teeth, whichever spur wheel is required to move the shaft in the direction desired. They are all open, more or less, to the objections before indicated. At any moment the failure of a single tooth in five or six spur wheels may bring such prompt destruction upon the whole unwieldy and costly fabric as may cost hundreds of pounds to repair, and as much more in loss of time and profit. The unobserved slackening of a nut, or a little settling of the foundation, may bring, and often has brought about, a like result without a moment's warning, and in a way which no human foresight apparently could have prevented. Even the ordinary wear and tear constitutes a very objectionable feature. Every year or two some at least of the wheels will be found to be so much worn as to be unsafe, and a tedious and costly stoppage is absolutely necessary.

If, however, reversing mills must be made, the first care should be given to foundations. No after care or skill will compensate for inattention to this point. In order to make the machinery as self-contained as possible, the most experienced mill wrights trust to heavy timber framing, or silling, as they term it. This is a very good plan, but I am inclined to think that all machinery of this kind would stand better on wrought iron riveted framing. By the adoption of this any amount of strength could easily be obtained, and the question of foundation proper would then become a matter of secondary importance. But whatever is done in this respect, these ponderous wheels and shafts, and their adjuncts, will always prove a source of trouble and expense. I think also that experience has now shown us, that any softening of the blow on the crab teeth, which may be accomplished by springs or otherwise, or any improved form of crab at all, not to mention the masses of complication which have sometimes been proposed, does not to any appreciable degree help us out of the difficulty. On the other hand, from the simple fact of their increasing rather than diminishing the number of working parts, we are rather worse off than we were before.

The great difficulty in applying experimental philosophy to matters of this kind consists, of course, in the circumstance of our inability to make more than a few complete experiments. No one can be building mills every day, trying first one plan and then another, until finally he hits upon the very best thing; and the question is settled by the survival of the fittest. Most of us have only one or two chances, and all we can do is to compare, as best we may, the result of the experience of others with that of our own.

This is the difficulty I experience in casting about for a substitute for what I cannot but consider as a clumsy contrivance, when I regard the simplicity of the operation which it has for its object. No doubt it will be held by some, that the question has already been solved, and the merits of mills in which the engine reverses, thus avoiding the use of wheels and crabs altogether, will be fully pointed out. The three high roll system, will also, no doubt, have its advocates. I am sorry that, having had no experience of either the one system or the other, I can only speak of them in a general and cursory way. I never could see any great objection to reversing the engines, except that a somewhat more costly engine is necessary, and that it cannot well be applied to most existing mills; but it has certainly struck me as a strange perversion of engineering skill to introduce spur wheels after all into an arrangement of this kind. I am totally at a loss to conceive what possible advantage is expected to result from running the engine three times as fast as the mill, and reversing the former spur wheels, and all at say 85 revolutions per minute, when 28 would have done just as well. Ramsbottom's mills have been built on this plan. There is also one at Seraing, and they are probably in use elsewhere. I know but little of their working, but should expect they will give nearly as much trouble as the old fashoned reversing mills. At Seraing, I believe, it is not intended to apply it to a large new Bessemer steel rail mill now in course of construction, which is to be a pullover mill, with some power lift behind the rolls. These lifts are used more generally in Belgium than in this country, and some of them may well merit our attention.

As the three high roll, as applied to plate rolling, has been fairly tried at several works in this district, I will not presume to express an opinion on its merits or otherwise, further than to say that, in point of productive power, no three high mill, in this country at least, has, I believe, ever yet rivalled the ordinary reversing mill of equal size. What other advantages it may have, I am not prepared to say. The plan I have now to propose possesses but little, if any, merit, regarded as an original idea. It is simply an adaptation of Brown's reciprocal mill to plate rolling. But I do not think that its real or intrinsic merit is any the less on this account. Rather the contrary. For often when we are satisfied to take a single step at a time, and that, perhaps, a very short one, we make more real progress than when we endeavor to witch the world with daring feats of engineering skill, and by a single leap to rid ourselves of all the difficulties attending our primary condition.

The only novel element in this arrangement of rolls is one consequent upon its application to plate rolling. (Mr. Hutchinson then gave a full illustrated description of his mill, which, however, we cannot, without the aid of the diagrams, make adequately intelligible).

The author continued: The advantages I should expect to result from the use of this arrangement would be as follows: It could easily be applied to any existing mill, and if not found to answer, the housings, rolls, pinions, would be available for use in the ordinary way, and, with the exception of the housings, would be of the ordinary kind. If the plan was found to answer, more iron could be rolled than in a reversing mill, as the quantity is frequently limited by the temperature of the rolls, which would evidently in this mill be lower for the same quantity of iron passed through than would be the case in any other form of single mill. But the chief advantage, supposing of course the quantity of plates rolled to be equally large, would be in the simplicity of its construction. There is no part that could not be replaced or repaired in an hour or two; nothing of unusual weight; no extra fitting; in fact, I should expect, that the repairs would be less, if anything, than in an ordinary mill always working in the same direction. Even the crabman's wages would be saved, as the wedge could be worked by the man or the boy who adjusted the screws. A few objections naturally suggest themselves. It may be said that a rough pile from the furnace, which should be compressed 2 in. or 3 in., the first time it passed through the rolls would not be found to slip through the first pair, without catching anything, as easily as it may be represented doing. But the pile should not be brought to the grain rolls in this state; and those mill managers who have not yet attained to the refinement of blooming rolls should study the merits of these before going any further.

Then it may be said that it would be found impracticable to preserve a uniform distance between the two pairs of rolls. As before stated, this might be so in the finishing rolls, but in the soft rolls, where 1-32 of an inch is unimportant, no such difficulty, I, think, would present itself. The pinions, it may be thought, would be likely to fail, as, in the back direction, all the power required in rolling would be transmitted through them. I think, however, this would only be a question of making broader teeth, even if this was found to be necessary. A tooth, say 2 ft. broad, and a proper form of housing, would stand any strain likely to be developed.

With regard to the finishing rolls, I believe, although there is much to be said on both sides, that, on the whole, no great benefit arises from reversing, and this opinion is endorsed by the able manager of the Skerne Mills, who always has the iron pulled over in the finishing process. There may be differences of opinion as to its effects upon the fibre of the iron, but the necessity of having a skilled roller behind as well as before the rolls, and the extra wear and tear of the machinery are serious objections, beside which there is not nearly so great a resulting anvantage as in the case of the soft rolls. I think, however, some simple contrivance could be devised for elevating the plate, and at the same time accelerating its progress toward the front of the rolls, whereby the boggy men's labor could be lessened, and a considerable saving of time effected. In Belgium various systems of lifting gear are in use, all more or less useful, I should imagine; and I can only account for their non-existance in this country in the same way as we may account for the perpetuation of many an antiquated custom or clumsy piece of mechanism still used in the manufacture of iron. Uniform wage rates and trades' regulations stifle invention, and throw cold water on every attempt at improvement. There is no inducement to study economy in labor; the same rate per ton must be paid after all.

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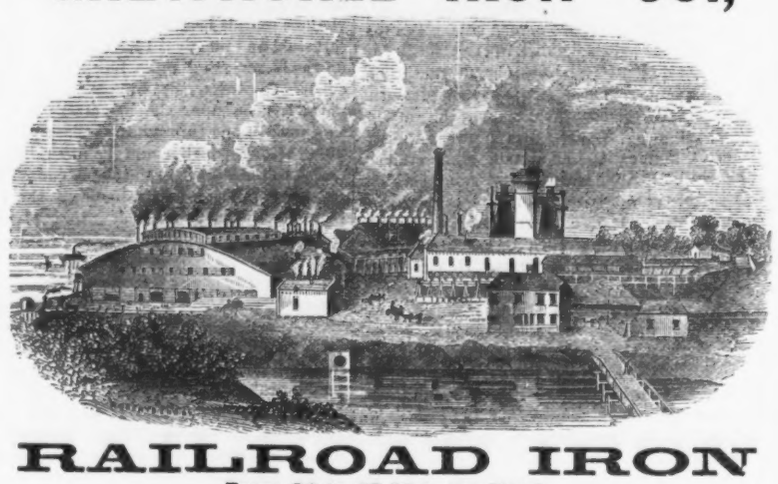

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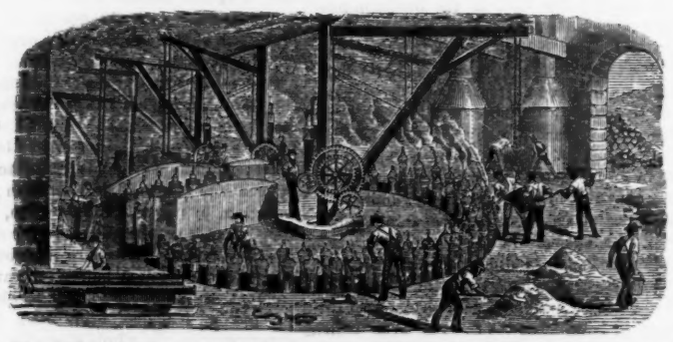

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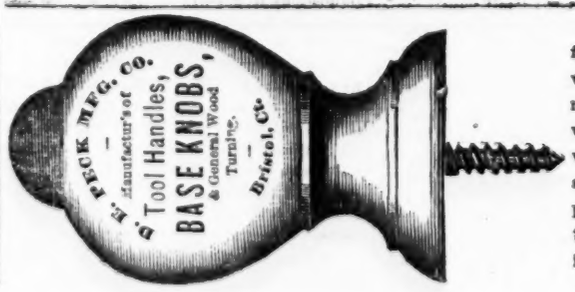

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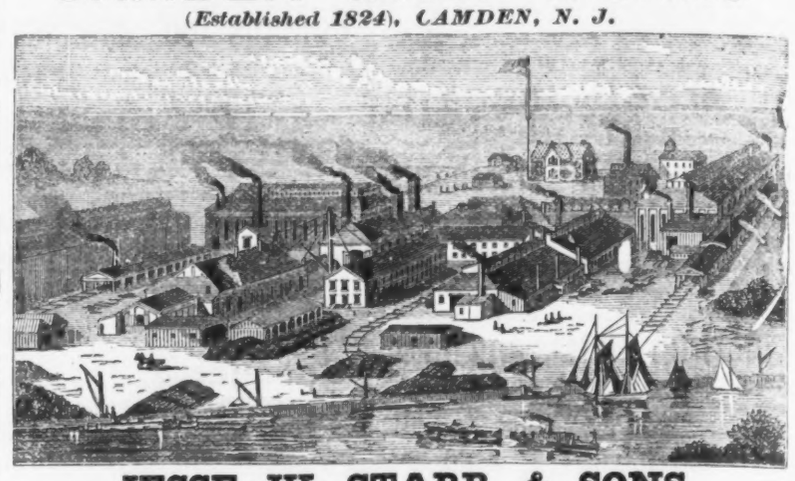

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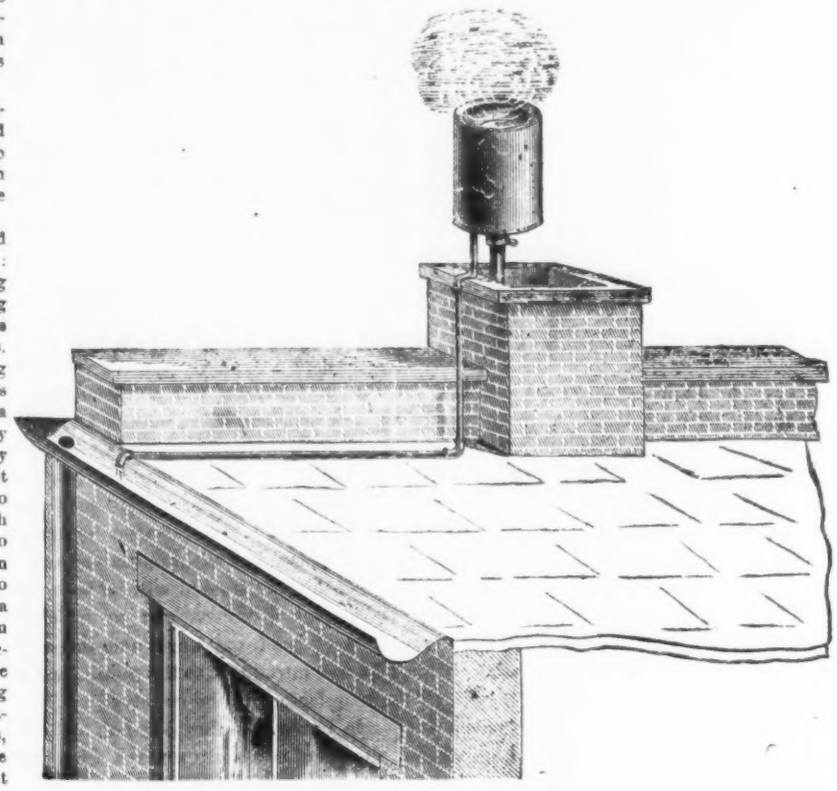
For further information we refer our readers to Mr. William J. Fryer, Jr., No. 90 Center street, New York.

Plumbing Work in the Western Union Telegraph Building.

Through the kindness of Gen. F. T. Locke we were this week shown through the Western Union Telegraph building, on the corner of Broadway and Dey street. The object of our visit was to see the plumbing work, which has been attracting a good deal of attention in the trade from its completeness and perfection of workmanship. The general system of pipes by which the building is supplied is of the most elaborate character, and resembles more a town water works than anything put up for the use of a single structure. Without cuts we should be unable to give any clear idea of the arrangement. The scale upon which they are constructed will be understood when we mention some of the more important points. A 5000 gallon tank in the roof serves as a reservoir. On each floor (and there are ten or more of them), there are three fire plugs to which hose will be constantly attached ready for use at a moment's notice. The larger distributing and main pipes are 8 inches in diameter. The leading lines of pipe are of iron, galvanized. The distributing pipes are seamless brass, tin lined and tin covered. Of these we shall have more to say at some future time. The supply of water is furnished from the Croton water pipes, and also from a large number of Artesian wells sunk in the cellar. A Worthington Duplex pump, of large size, is used to force the water into the tank on the roof, and to supply the lines of hose in case of fire. It is, in fact, a stationary fire engine, and can be used both for the internal as well as external protection of the building. In case of a fire near this enormously tall building, advantage is taken of its hight to throw streams of water down upon the fire, the pump in the cellar acting the part of a fire engine. Pumping is necessary in all down town buildings, as the force of the Croton will not always carry it to the first story. There are to be several elevators, four in all, we believe. One of these is driven by hydraulic power, and is, we think, in many respects the most admirable one which we have ever seen. The water for it is supplied through an 8 inch wrought iron pipe of the most substantial character. This elevator gets its power and supply of water from the 5000 gallon tank above mentioned.

The water closets, bath rooms and toilet rooms are almost numberless, scattered from the basement to the roof. In their style and arrangement, as well as in the quality of their fittings, they are models of the very best modern practice. A description of one of these, a room on the second floor, devoted to water closets and urinals, may be of interest, and will, at least, serve to show the perfect manner in which the work is done. The floor is solid concrete, without a break or joint into which any liquid could find its way. Three urinals and three water closets are to be placed in the room. On the side where the urinals are to stand a concrete and brick platform a few inches high is built, and faced and covered with dark purple Vermont slate. The backs and divisions are of marble "Brockadilla" or "Mourning Vein." The urinals are of porcelain, with large overflow and supply pipes, which are carried off in the wall, and connected with the general system of drainage and supply pipes. Stone, metal and earthen ware are all the materials used, except for the supply and waste pipes. The water closets are each fitted with a tank; on the floor beneath the seat is a lead "safe" or pan, which, covering the whole space and soldered to each pipe passing through it, effectually prevents any leakage from getting out on the floor. The safe has an overflow with a grate, so that water falling into it is carried off at once. How completely this is done will be understood from the fact that the drip from these safes does not go into the waste pipes or soil pipes, but the overflow from each one goes directly to the cellar in a separate system of pipes, which is entirely distinct from the ordinary soil and waste pipes. This, of course, reduces the danger of overflow or leakage to a minimum. The closets in the room of which we speak are flushed automatically by the opening and closing of the door. The water closet fixtures, wherever we had an opportunity of inspecting them, were first-class. Messrs. Locke & Munroe, 1308 Broadway, the contractors, have in this case produced perhaps as good a job of plumbing as we have in the city, and in many respects have exceeded the best work heretofore put up. That they should profit by the experience which they have had in the Equitable and Drexel buildings, Lennox library and several other buildings of that class, is to be expected.



EXHAUST TRAPS FOR STEAM PIPES.

[From the Decatur (Ill.) Republican.]

Hill's Hog Ringer Factory.—How a Small Business has Grown into Huge Proportions.

We know of no instance that any better illustrates the potency of persistent, well-directed effort, than is afforded by the growth, from small beginnings, of some of our most successful manufacturing enterprises. And among those with which we are most familiar, none furnishes a better illustration than that of H. W. Hill & Co., of this city. It is now only a little more than two years since the gentlemen comprising this firm first began to manufacture their hog rings, and, like many another enterprise which afterward grew into importance, their beginning was of the most modest character. A crude and unwieldy machine for cutting the wire into the proper lengths, and another equally crude and unsightly appliance for forming and shaping the rings, comprised all the facilities of the establishment.

But the merits of their invention, properly set before the public by a judicious system of advertising, soon resulted in convincing them that a more rapid system of manufacturing their goods must be devised in order to supply the increasing demand. And so they called to their aid the assistance of the best machinists they could find, and as experience showed wherein each new appliance was defective, they kept on improving their machinery until now it seems as near perfect as any mere human invention can be.

We took a look through their establishment recently, and were charmed with the precision and system which appeared to prevail in each department. The office, in which the business of the firm is transacted, is a model of neatness, and in its arrangement every attention has been paid to the securing of convenience in the dispatch of business. Here several clerks are kept constantly employed in putting up and mailing the various kinds of advertising matter used by the firm. In this department the same system and order prevail which are observable everywhere about the establishment. About 1400 circulars are sent out every day. Back of the office is the packing room, where the rings, ringers and tongs are put up in packages for shipment to all parts of the United States. Still back of this is another department, in which the rings are made. Two ingeniously contrived machines here keep up a continuous clatter, eating up over four miles of wire per day, and turning out from 100,000 to 120,000 rings every ten hours. The wire is taken from the coil directly, shaping the rings, the machine cutting it into exact lengths, and counting them in parcels of 100 each. A boy attends each machine, his duty being to remove the package, as the slide cuts off the feed after each hundred has been counted. While the next paper box is being filled the boy finishes the "doing up" of the last package, and completes it ready for the packer by pasting a neat label upon it. In the room below this is a small caloric engine, which furnishes the power for running the machinery.

Some idea of the demand for this simple little contrivance, which prevents the hog from rooting, may be realized when we state that over 16,000,000 of Hill's rings have been sold in a little over two years. A recent improvement, which the firm has introduced, is the manufacture of a ring from tinned wire, which is becoming quite popular, if the demand for them is any proof of popularity. The superiority of the tinned wire ring lies in the fact that it does not rust in the hog's nose.

The Delaware Rolling Mill and Axle Works.

The Delaware Rolling Mill at Phillipsburgh, N. J., was founded by a private firm in 1867, but in 1868 it became an incorporated company with a capital stock paid up originally of $50,000, and subsequently increased to $70,000, and the investment at this time amounts to $180,000. The management is in the hands of capable and thorough going business men, who have made it a success from its organization. The officers are Messrs. John Tindall, president; P. H. Pursall, secretary; Jacob T. Shimer, superintendent, and John S. Rees, assistant superintendent. The directors are Samuel Drake, Mark T. Warne, and John Shouse, beside the president, Mr. John Tindall, who has general oversight of the establishment. He is an active, energetic man, of good business qualities and unquestionable integrity. He is ably assisted by the secretary, Mr. Pursall.

The establishment covers over two acres of ground overlooking the Delaware River. It has very superior transportation facilities, which is always an important item in the iron business. It is convenient to the Morris Canal, also the Lehigh and Delaware Canal, and the Belvidere and Delaware division of Pennsylvania Railroad, Central New Jersey Railroad, Delaware, Lackawanna and Western Railroad, Eastern and Amboy Railroad, Lehigh Valley Railroad, and Lehigh and Susquehanna Railroad. Thus the location is rarely equalled. The town is large enough to furnish plenty of hands; it is a high, a healthful location, the taxes are light, and the proximity to the coal fields combine to make Phillipsburg unexcelled for a manufacturing town. We feel certain that any one looking for profitable investments could not do better than to locate in this region.

The company now occupies a rolling mill 200 x80 feet in size, equipped with 2 heating furnaces, 7 puddling furnaces, 2 steam hammers, 4 shears, one for cutting railroad bars, two train of rollers, one 9 inches and one 16 inches. The blower was manufactured by B. F. Sturtevant, of Boston. They turn out about 300 tons per month of merchant iron, and have capacity to manufacture 600 tons per month, valued at $40,000. The quality of the iron turned out by the Delaware Rolling Mill is of a very high order, and well known to the trade in Philadelphia and New York, where the greater portion of it finds a market. The power of the establishment is furnished by four steam engines, one of 140, one of 40, one of 30, and one of 5 horse-power. These are furnished with steam by 12 boilers—8 cylindrical, 3 flue, and 1 tubular.

Connected with the rolling mill is an axle works. This department embraces three distinct buildings. One is 28x30 feet in size, and contains the forges and where the turning and finishing is done. Another, 24x80 feet in extent, is used for the manufacture of the boxes and for a machine shop, where all the repairing is done. This is fitted up with all the most improved machines for planing, boring, turning and working iron. The third is the wareroom, where there is kept a large variety of axles of various sizes, from five-eighths to four inches in size. The trade in this department is very extensive, turning out 12,000 per month, valued at $60,000.

Reasons for Using our Goods.

Hogs when ringed are prevented from rooting, and fatten quickly.

Pastures and clover fields are kept smooth and are not destroyed by the hogs rooting them up.

Feed lots in the winter are kept smooth, and corn that is otherwise rooted and tramped into the ground is saved.

The **Triangular Wire Ring, manufactured only by us,** is the only wire ring that can be inserted in the hog's nose with one grip on the **Ringer,** and is the only ring that will remain in a hog's nose, as it fits close, will not turn in for the joint to irritate the nose, is not liable to be torn out, and heals quickly.

No puncturing of the nose required to insert our ring.

For Sale by the Leading Jobbing Hardware Houses of New York, Baltimore, Cleveland, Columbus, Cincinnati, Dayton, Indianapolis, Lafayette, Chicago, Milwaukee, Burlington, Davenport, St. Louis and San Francisco.

SOMETHING NEW.

We shall this present season make a **Heavy Tinned Wire Ring** that will not rust in the hog's nose. The strongest and best ring in the market.

Prices.

Ringers, retail	$1 00
" per doz	6 00
Rings per box (100) coppered wire	50
" per doz boxes (1200) "	3 00
" per box (100) tinned wire	60
" per doz. boxes (1200) tinned wire	4 00
Tongs or Holders retail	1 25
" " per doz	9 00

The coppered wire ring will be sent unless otherwise ordered.

Samples by mail postpaid on receipt of retail price.

Goods sent C. O. D. with privilege of examination before paying charges.

Net prices in quantities, circulars and posters mailed free.

Our advertisements are now inserted in over 1800 newspapers, published in every State of the Union, so that dealers will find a large demand created for our goods.

THE NICHOLSON FILE.

All Nicholson Files are cut with the Patent *Increment Cut*, an invention owned and controled exclusively by us, the file cut in this manner being Patented as a new article of manufacture, and differs from all other machine cut files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly *expanding or increasing in size and space from the point*, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at least) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will *not* be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformity of machine work. It is now upwards of seven years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

We put all files under seven inches in boxes of either one-half or one dozen each. These boxes are neatly arranged, and open on the end, on which the kind is plainly marked with printed labels, acknowledged improvements on the old methods.

The "*Increment File*" is not an experiment, but an established fact, and already has acquired a legitimate demand or upwards of 500 dozen per day. We employ no *regular Travelers*, but our goods may now be found in the hands of the principal jobbers and dealers throughout the country.

Prices and terms will be forwarded on application to

NICHOLSON FILE COMPANY,
Providence, R. I.

USE THE BEST.

Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

FILES AND RASPS.

XTRA QUALITY,
MADE FROM THE BEST
IMPORTED STEEL
BY THE
Auburn File Works,
AUBURN, N. Y.

JOHN ROTHERY'S Celebrated Hand-Cut FILES,

Made of Best English Cast Steel.

WALSH, COULTER & FLAGLER, Sole Agents,
83 Chambers and 65 Reade Streets, N. Y.

EDWARD PHELAN,

Surviving Partner of W. F. SHATTUCK & CO.,
No. 113 Chambers and 95 Reade Streets, New York,
MANUFACTURER OF AMERICAN HARDWARE.

Coes & Taft's Pat. Wrenches.
Axe, Pick, Sledge & Hammer Handles.
Gimlet and Gimlet Bits.
Augers and Auger Bits.
Cocoa Nut Dippers.
Wire Screws.
Scale Beams.
Patent Tap Borers.
Brundage Horse Nails.
Maguire's Wr't Iron Goods.
Shattuck's Platform Counter Scales.
Yaw's Cow Bells.
Axes, Picks and Machetes.

DEAN'S New Patent (1873)
Screening Scoop SHOVEL

For Coal, Coke and Coal Ashes, and other Substances.

The largest frames are 12 by 18 inches, with seven bars, and are made of the Best Malleable Iron. They are, or can be, wired between bars by an arrangement of holes a quarter of an inch apart, by an ordinary person, to screen any size substance desired. They are warranted to be the most durable and practical Screening Shovel made, or money refunded.

Reference—All New York Gas Companies and Hotels.

☞ Smaller sizes on hand.

Please address orders to

A. SEE & SON,
N. Y. Shovel Works,
1358 Broadway, N. Y.

Price: Largest size $30 per doz., and upwards, according to size of spaces.

Clement & Hawkes Mfg. Co.,
Manufacturers of
SHOVELS,
Planters' Hoes, Trowels and Machinery.
Northampton, Mass.
☞ Send for Circular and Price List.

Schweitzer Mfg. Co.,
57 Reade St., N. Y.
IMPORTERS & JOBBERS.

Established 1816.

Peter A. Frasse & Co.,

95 Fulton Street, New York,
SOLE AGENTS FOR
Thomas Turner & Co.'s Suffolk Works,
SHEFFIELD.
FILES AND HORSE RASPS,
And Importers of
STUBS' FILES, TOOLS & STEEL,
W. J. Davies' Sons' London Emery Cloth,
HUBERT'S FRENCH EMERY PAPER.

EVERY FILE WARRANTED.
Equal to the
BEST.

Western Files. Western Files. Western Files. Western Files.

Works, Beaver Falls, Pa.
Office, 96 Chambers St., N.Y.

LARGEST CAPACITY
Of any File Works in the World.

In the face of strong prejudice against American files, this brand has earned a reputation second to none. The trade in all sections testify to their excellence. We confidently offer these files as superior in every respect and cheaper than any first-class file in the market. A trial will confirm their reputation.

Backus's Patent Bit Brace AND Angular Extension BORER.

Q. S. Backus,
SOLE MANUFACTURER OF
ANGULAR EXTENSION BORER.
Salesroom. 82 Chambers St., N. Y.

This tool can be used in any brace, at any angle, and also for straight work. Is the best and most convenient tool of its kind ever offered to the public. Eight thousand sold the first year.

Also Manufactures the Straight Extension
Backus's Pat. Improved Bit Brace.

The socket is arranged so that the strain does not come on the jaws, but on the square hole which fits the shank of the bit. The jaws attached to the sleeve hold the bit firmly in the square, and center it truly. The sweep is of wrought iron. The general finish of the stock is good. Its appearance is neat. Mechanics who have used it unanimously pronounce it superior to all others; and we offer it to the trade as the strongest, most simple, and quickest operating brace in the market. We manufacture five sizes. The number of inches of sweep corresponds with the commercial number of the bit.

BUSINESS ITEMS.

PENNSYLVANIA.

The rolling mill in Hamburg, together with two tracts of land and tenement houses, were sold at the Merchants' Exchange, Philadelphia, to the Philadelphia and Reading Railroad Company for $5000. The railroad company hold mortgages on the mill to the amount of $26,000. The probabilities for the resumption of work are strong.

The practical nailers of Birdsboro' have invented an improved self-feeding nail machine that will cut from a small tack to an inch spike.

The main building of the new rolling mill at Chester will have a span of 100 feet by 200. About 75 men are now employed pushing forward the work.

New Market Forge, in Lebanon county, has been leased by Mr. Ephram Borgner, and operations will be resumed shortly.

The Keystone furnace, at Glendon, will be in blast within a few weeks.

The Stempton car shops, Lehigh county, recently resumed operations on an order for 300 coal cars from the Pennsylvania Railroad Company, and are now engaged in turning out 1500 cars for the Central Railroad of New Jersey.

The chain works at Schuylkill Haven will consume much of the iron manufactured by the rolling mill of that place.

Work at the Sheridan furnaces is brisk. The new stack house is being raised and the new furnace will soon be in blast.

MASSACHUSETTS.

A. G. Coes & Co., of Worcester, manufacture Coes' screw wrenches at the rate of from 15,000 to 20,000 a month. Fifty hands are employed, and they occupy two buildings, one 70x30 feet, and the other 45x35 feet, each two stories high, with Ls, etc. Shipments are made to Germany, to Australia and South America, and latterly to Japan, where the introduction of American machinery on a large scale causes a demand for smaller tools of all descriptions.

The men in the Fitchburg Railroad shops are now working eight hours, and their wages have been reduced 10 per cent. The pay of the men in the Boston and Albany shop has been reduced 10 per cent. The Boston and Providence and Old Colony shops have adopted the eight hour rule, the New York and New England nine, and the Boston and Maine are running their shops full time. The Lowell Railroad has reduced the wages of the employes 10 per cent.

MAINE.

The Portland Rolling Mills manufactured 14,650 tons of rails the past year.

The Knowlton Platform and Car Coupling Company has been organized at Rockland, for manufacturing platforms and car couplings, and selling licenses to use the same, under letters patent issued to C. H. Knowlton, dated Nov. 26, 1872, and April 1, 1873. Its capital stock is $50,000, in shares of $100 each, and all paid in.

The rolling mill at Portland has started up, after remaining idle for a month while undergoing repairs. A new fly-wheel has been put in and other improvements made.

RHODE ISLAND.

The large Printing Press Works of Messrs. Cottrell & Babcock, at Westerly, are not only running full time with 160 hands, but are expected soon to begin night work. They have been running night hands for the past three years, with probably about a month's exception.

CONNECTICUT.

The Hartford *Courant*, of Jan. 23, says: The greater part of last week was occupied in getting over the Connecticut Western Road two locomotive car loads of castings shipped at the foundry in Newburg, N. Y., to Providence, for the new water works in that city. The weight of the castings, 64 tons, is the greatest probably ever taken on two cars over any road in Connecticut. One single piece weighed 24 tons. Some of the largest projected so far over the cars that in some places on the Western Road it was found necessary to make additional cuttings of rock in order to secure a passage through, and at West Winsted the castings were jacked up to get them above the trusses of a bridge, the delay being occasioned by these unforeseen obstructions. The trains reached this city on Friday night, and early Saturday morning were started for Providence, and arrived there safely early in the evening. Provision was made before starting for all anticipated emergencies, such as encountering narrow spaces in bridges or in rock or earth cuttings, but no obstruction to cause delay occurred, and Providence is probably now light-hearted and happy in the possession of a product which has been a load everywhere else.

OHIO.

Messrs. Wick, Ridgway & Co., manufacturers of railroad iron, Youngstown, are erecting a 16 inch train, for small rails; also, a new 26 by 30 horizontal engine to drive the same. The roll train was manufactured by Messrs. Ward, Booth & Miller, of Youngstown, and the engine by Messrs. Dick & Church, Meadville, Pa. The train will be completed by April 1st, and will give the firm complete facilities for manufacturing.

At Cherry Valley the iron company are running their furnaces full blast, and have decided to start the rolling mills and remaining furnace, giving employment to 200 hands.

The Hazelton, Mahoning county, Furnace, yields 180 tons per week of good marketable iron. It has been running constantly since January, 1873.

The sewer pipe shops at Akron and neighborhood are running on one-third time, about 150 men being out of employment in consequence.

The sewer pipe works of Sperry, Ritchie & Co., at Talmadge, are being enlarged to double their present capacity.

The Eagle and the Hocking Valley shops, at Lancaster, are full of orders for corn shellers and cutting boxes, and are running on extra time. They each employ from 60 to 70 hands.

About 800 men are employed at Lagondr, in machine and chain shops there. They are working to their full capacity.

The Wellston Furnaces are nearly finished, and will start as soon as completed.

IOWA.

A new company has been organized at Clinton, to build shops for the manufacture of wooden and iron bridges of all kinds. Mr. E. S. Hart is president of the new company and J. Scott Jenkins, engineer.

TENNESSEE.

The Knoxville Car Wheel Company's Works, at Carter's Furnace, have stopped work until spring.

The machine shops of the Memphis Railroad Company, at Argenta, were burned January 30. Loss, $30,000.

TENNESSEE.

The Roane Iron Company's Rail Mill, at Chattanooga, stopped recently for an indefinite time. The mill will probably start up again soon, and continue in operation for about eight months. It is stated that the mill owners have contracted to deliver the iron for 100 miles of the Cincinnati Southern Railroad.

MARYLAND.

Poole & Hunt, Union Works, at Baltimore, cover some eight acres of ground. Their buildings consist of an iron foundry, brass foundry, machine shop, melting house and pattern shop. The company employ about 350 workmen, and have done work for some of the largest establishments in the country.

The rail mill of the Abbott Iron Company, at Canton, has resumed work after a stoppage of two months.

KENTUCKY.

The Louisville Bridge and Iron Company have received orders recently which will furnish their establishment with work for some time to come. A contract for a three-span bridge over the Hiwassee River, on the East Tennessee, Virginia and Georgia Road, has also been received.

The Bath Iron Furnace Company, near Mt. Sterling, have been thrown into bankruptcy upon their own petition. Their liabilities are said to amount to about $150,000.

VERMONT.

The Fairbanks Scale Company, at St. Johnsbury, are executing a large order for scales just received direct from Russia. These scales are made to weigh in poods, each pood being about 40 Russian pounds, which is equal to about 36 pounds avoirdupois. Their orders for scales, so far this season, have been largely in excess of last year. This company have a world-wide reputation, and receive orders from nearly all countries on the face of the globe.

The National Horse Nail Company, at Vergennes, was incorporated in 1868, with a capital stock of $100,000. They occupy two large buildings; the rolling mill is 70x50 feet, and the nail factory 100x30 feet. The iron used is imported from Norway in bars 4½ feet in length by five-eighths of an inch in thickness. The works have a capacity of 1½ tons per day. The power is supplied by two Tyler wheels.

The following, concerning the old splitting mills so common in the early days of rolling mills, but which are now seldom used, was first found in Letters, Conversations and Recollections of S. T. Coleridge, and is also given in Scrivenor's History of the Iron Trade, will be of interest to many who have not seen it in either of the works mentioned: "The most extraordinary and the best attested instance of enthusiasm existing in conjunction with perseverance, is related of the founder of the Foley family. This man, who was a fiddler, living near Stourbridge, was often witness of the immense labor and loss of time caused by dividing the rods of iron, necessary in the process of making nails. The discovery of the process called splitting, in works called splitting mills, was first made in Sweden, and the consequences of this advance in art were most disastrous to the manufacturers of iron about Stourbridge. Foley, the fiddler, was shortly missed from his accustomed rounds, and was not again seen for many years. He had mentally resolved to ascertain by what means the process of splitting of bars of iron was accomplished; and, without communicating his intention to a single human being, he proceeded to Hull, and thence, without funds, worked his passage to the Swedish iron port. Arrived in Sweden, he begged and fiddled his way to the iron foundries, where, after a long time, he became a universal favorite with the workmen; and, from the apparent entire absence of intelligence, or anything like ultimate object, he was received into the works, to every part of which he had access. He took the advantage thus offered, and having stored his memory with observations and all the combinations, he disappeared from amongst his kind friends as he had appeared—no one knew whence or whither. On his return to England he communicated his voyage and its results to Mr. Knight and another person in the neighborhood, with whom he was associated, and by whom the necessary buildings were erected and machinery provided. When at length everything was prepared, it was found that the machinery would not act; at all events, it did not answer the sole end of its erection—it would not split the bar of iron. Foley disappeared again, and it was concluded that shame and mortification at his failure had driven him away for ever. Not so; again, though somewhat more speedily, he found his way to the Swedish iron works, where he was received most joyfully, and, to make sure of their fiddler, he was lodged in the splitting mill itself. Here was the very end and aim of his life attained beyond his utmost hope. He examined the works, and very soon discovered the cause of his failure. He now made drawings, or rude tracings: and having obtained an ample time to verify his observations, and to impress them clearly and vividly on his mind, he made his way to the port, and once more returned to England. This time he was completely successful, and, by the results of his experience, enriched himself and greatly benefited his countrymen. This I hold to be the most extraordinary instance of credible devotion in modern times."

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS, TOOLS FOR BRAZING, &c.

Bed Screws, Pin Hinges, and Wire Nails a Specialty.

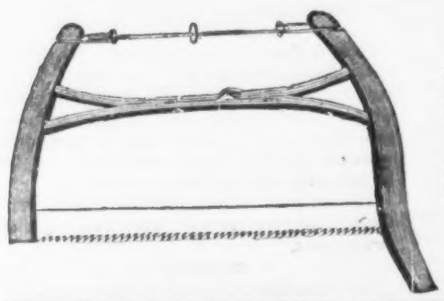
H. W. PEACE,

MANUFACTURER OF

Saws of all kinds.

FACTORY, WILLIAMSBURGH, N. Y.

Elliptic Forked Saw Frame.



Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,

Sole Proprietor & Manufacturer,

VULCAN SAW WORKS.

WILLIAMSBURGH, N. Y.

THE SILVER STEEL DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.

Patent Secured

PATENT HANDLES AND GAUGE INCLUDED.

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by **E. C. ATKINS & CO., Indianapolis, Ind.**, who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

E. C. ATKINS. H. KNIPPENBERG.

E. C. ATKINS & CO.

Saw Manufacturers and Repairers, Indianapolis, Ind.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.

Stearn's Hollow Augers and Saw Vises

Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

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IMPORTERS AND WHOLESALE DEALERS IN

HARDWARE, CUTLERY, &C.,

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Celebrated FILES AND HORSE RASPS.

Rough and Ready and CLIPPER SCYTHES, Warranted.

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THOS JOWITT & SON TESTED CORPORATE MARK

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(American)

FILES AND HORSE RASPS

"WIDE AWAKE"

AXES.

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McKINNEY MFG. CO., Hamilton, O.

Wrought Butts, Strap & T Hinges.

Send for special discount sheets.

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Hardware Merchants,

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HORSE SHOES.	HORSE NAILS.	HORSE RASPS,
Burden's,	Putnam's,	Thos. Turner & Co.'s,
Perkins',	Globe.	Sheffield, Eng.
Snow.	Vulcan,	TOE CALKS,
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Manufacturer of

Saws of all kinds.

Also Sole Manufacturer of

LIGHTNING SAWS.

Two Direct Cutting Edges, instead of one Scraping point.

Note extra steel and durability over the old **V**, outlined on **M** tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

To HENRY DISSTON & SONS:

Philadelphia, Pa.

I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.

Henry Disston & Sons cannot furnish Lightning Saws. Why do they imitate mine?

J. FLINT,

Manufacturer of

ALL KINDS OF

SAWS

And Plastering Trowels,

ROCHESTER, N. Y.

A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.

Putnam's Government Standard FORGED HORSE SHOE NAILS.

Manufactured from the best of **NORWAY** Iron, nd warranted to give entire satisfaction.

S. S. PUTNAM & CO.,

NEPONSET, MASS.

Rogers' Self-Sharpening HOE.

The best Hoe in market. It will not batter or break. Wears itself sharp. Will last twice as long as any other Hoe, and is warranted to cut the "Bolles Hoe" or any Hoe in market.

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A. PARDEE & CO.,

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Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves, and firms connected with us, viz.

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Manufacturers of Warranted Cast Steel

SAWS

of every description, including

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&c., &c

Cast Steel Files

of the well known brand of

Wheeler, Madden & Clemson.

FACTORIES:

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BRANCH OFFICE:

97 Chambers Street, New York.

BRUNDAGE FORGED HORSE NAILS,

Manufactured from

BEST NORWAY IRON,

by BRUNDAGE & CO. Sold by

WHEELER, MADDEN & CLEMSON

Middletown, Orange Co., N. Y.

I make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

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Manufacturers of

AXE, PICK, GERMAN & AMERICAN SLEDGE, and other Handles.

Full assortment always on hand.

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Patented,

June 3, 1862; April 6, 1869; Dec 23, 1873; Jan. 20, 1874; Dec. 22, 1874.

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JAPANNED and PATENT EUREKA Bright Metal

BIRD CAGES.

Nos. 247 & 249 Pearl Street

NEW YORK.

H. CARTER,

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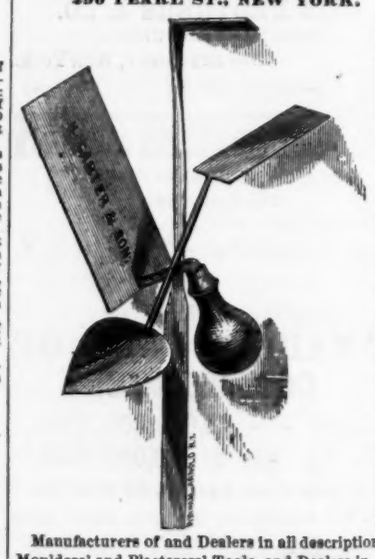

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Manufacturers of and Dealers in all descriptions of Moulders' and Plasterers' Tools, and Dealers in General Hardware, Gilded Copper Weather Vanes.

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AMERICAN RAZORS.

EACH RAZOR WARRANTED.

We guarantee these Razors in style, finish and *quality* equal to the *best* imported.

Price List.

No. 50,	Black Horn	₱ doz	$8 75	No. 69,	Black Horn Hollow Ground	₱ doz	$11 50
" 52,	" Hollow ground	"	7 75	" 70,	"	"	6 50
" 53,	"	"	7 00	" 71,	"	"	6 75
" 54,	"	"	8 75	" 72,	Amber Horn	"	8 50
" 57,	" Hollow ground	"	8 75	" 73,	Black " Hollow ground	"	11 50
" 58,	" Hollow ground	"	7 25	" 74,	"	"	10 50
" 59,	" Hollow ground	"	8 00	" 75,	" Ger. Concave	"	9 50
" 65,	Ivory	"	13 50	" 76,	Amber Horn	"	9 50
" 66,	"	"	14 50	" 77,	"	"	9 50

Discount to trade, 5 per cent.

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Feb. 22, 1875.

The week just closed has been made lively in business circles by several important occurrences, which, despite the weather, have caused considerable excitement.

The scarcity of fuel for the anthracite furnaces of the Lehigh and Schuylkill regions has at last shown itself so plainly as to cause some apprehension, and a sharp advance, equal to $2 per ton of pig iron, has been the result. Possibly a portion of this is due to the probable return of the Pittsburgh boilers to work, at the manufacturers' rates, but most of it is undeniably from the really small stock of pig iron now existing, and the certainty that, unless coal can be obtained, almost all the producing furnaces of both valleys must blow out. It is clearly evident that so long as the iron trade is at the mercy of a combination of corporations for the supply of fuel, it must be disturbed from time to time to the detriment of all concerned. The war between the Baltimore & Ohio and the Pennsylvania railroad companies has affected business and unsettled transactions to a considerable degree. The question of low passenger fares is one which the business community will leave to officers and stockholders of the conflicting companies to settle at their leisure; but the great uncertainty as to freight rates—prices being changed from day to day and hour to hour, and to suit each new shipper—makes mischief for Western shippers and upsets all business calculations. Both companies are strong, and the present contest is only the renewal of an old railway vendetta existing since the earliest days of both companies. The *Railway World* takes the most business-like view of the situation we have seen. By tabulating from the annual reports of both companies their capital, securities, rolling stock, etc., it shows the capacity and resources of both combatants, and arrives at the conclusion that the Pennsylvania Railroad stands the best show of success in a prolonged contest. Meanwhile, under present rates of passenger fare, it is a little cheaper to "Go West, young man" than to stay at home—though why any one not driven by business should want to go West at this hyperborean season does not appear. While discussing the conflict between rival railroad companies, it is well to note that some of the sufferers from the coal combination have united in petitions to the Legislature against the Reading Railroad Company and its offspring, the Coal and Iron Company. Among these is one reciting the history of the Land Run Improvement Company charter (the basis of the Coal and Iron Company's charter), and the way it was managed.

It further complains that the Reading Railroad Company is the only stockholder of the coal and iron company, and through it has engaged in business unlawful by its own charter. After accusing both companies of tyrannical abuse of powers, never intended to be granted either, the memorial begs for an investigation with persons and papers, and, on proof of its statements, that the railroad company "be forbidden forever hereafter by purchase, lease, or other device, to engage directly or indirectly in any other business than that of common carriers, for which alone they were created." All of which is very good if it were honest, but State Legislatures are notoriously mills to grind private axes, and this movement is suspiciously like the species of legislation known as the "pinch" act, viz.: bills to extract money from plethoric corporations. The price the coal and iron company could afford to pay for one property would settle all this trouble quickly, and no corporation of its magnitude has anything to fear from individual opposition, no matter on how just grounds it may be based. One honest measure of great importance is however before our Legislature, and this is an "act to provide for the protection of the children of this State in their right to acquire useful trades." This is a direct blow against the trades unions, and as it develops strength will probably pass, as every manufacturer knows it is impossible to obtain or instruct apprentices to their business, owing to the laws of the trades unions. To what an extent this is adding to our crime class among American youth is to be seen from the following pertinent letter. The truth and force of this statement are so evident that it is only to be regretted it is not national instead of State action it endorses:

EASTERN STATE PENITENTIARY,
PHILADELPHIA, Feb. 17, 1875.

Hon. Thomas V. Cooper, State Senator—DEAR SIR: I see from the morning papers that you introduced a bill yesterday entitled, An Act to protect the children of the Commonwealth in their rights to acquire useful trades. Allow me to thank you for the interest you take in this important question, and at the same time urge you to press the subject to a successful conclusion. The want of a knowledge of a trade by which an honest living can be made is emphatically the fruitful source of crime in the Eastern District of this State.

We received into this Penitentiary during the last year, 278 prisoners, 137 of whom were 25 years of age and under. Only 4 31-100 per cent. of the whole number had been apprenticed to trades. We seldom, and I might almost say never, receive a good mechanic; and, if at all, his crime is not against property but against person, and usually committed in a fit of intoxication. If the children of the State could be taught some handicraft by which an honest livelihood could be obtained, a fruitful source of crime would be stanched. But if they are to be barred out, as in the last two decades, we shall have our prisons overflowing with a crime class engendered by idleness.

Yours, truly,
JOHN RUTH, Moral Instructor.

At the monthly meeting of the Board of Trade, held during the week, an interesting discussion relative to the Oil Pipe Bill, now before the Legislature, was had. The majority appeared in favor of a properly restricted pipe bill, and the idea seemed to be generally entertained that a pipe line would be laid directly to this city for the transportation of oil. During the discussion Mr. Samuel J Reeves stated that he had seen, a few days ago, in a book published in England, an assertion that iron masters there can use oil taken from this State to heat their iron, and do so more cheaply than with their own coals. If this were true, he thought it offered an important suggestion to the iron workers of this State and country. It is clear that some arrangement must be perfected to cheapen the cost of fuel to iron makers, and it is surprising, with the great abundance and low price of petroleum, that greater progress has not been made in this direction. The condition of the iron trade has been such as to prevent any experiments of late; but the oil producers and pipe companies could well afford to offer premiums for the best application of liquid fuel to iron working, steam generation, and the like, and to expend the necessary funds to test all meritorious plans offered.

The Reading Railroad Company resumed work at the principal shops at Reading on the 15th inst. Half the former force is employed on eight hour time. As soon as the coal troubles are settled the full force will be employed along the entire line of the road. In this city injunctions pending against loans for gas and sewer purposes have been denied, which will permit of the employment of large numbers of men now idle, and with the return of mild weather, and the resumption of Centennial work, it is believed that the demand for both skilled and common labor will be active here.

Use of the Spectroscope in Puddling.

In describing the use of the spectroscope in the Zwickan process, Mr. A. McMartin says: One never tires watching the brilliant changes in the spectrum, blow after blow. The specific cause of these changes have been the subject of much dispute and unsatisfactory investigation. But all are agreed that carbon has something to do with them, whether as such, or in gaseous form in such nitrogeneous compounds as cyanogen. Whatever be their cause, these changes do take place—and that so regularly that an experienced eye can place full dependence upon them as indications of the state of preparation of the metal bath. The spectrum at first appears without lines; but as soon as the spark period begins to give place to its successor, and clear flame to extend out of the mouth of the converter, the bright orange yellow sodium line quickly makes its appearance, and remains clearly visible till the blast is turned off. After the sodium line appear the red lines which represent calcium lithium; and then a beautiful series of perfectly graded green lines in the green, and pale blue lines in the blue section of the spectrum, manifest themselves, one after another, each in its series, until at the climax of the operation, when the greatest heat is attained, the spectrum rivals that of chloride of copper in beauty and brilliancy. A very experienced eye can also see a beautiful violet line in the violet section at this point.

But the characteristic lines of the Bessemer spectrum are the beautiful, band-like, graduated series in the blue, and especially in the green section. In the inverse order to that in which they arose to their climax, these lines gradually diminish in brilliancy, and at last vanish. But some of the green lines still remain, after the blue series has entirely vanished; and at this point nothing must be allowed to distract the conductor of the operation from closely watching the spectrum; for the only index (though a perfect one) of the exact end of the operation, is the degree of brilliancy of certain green lines, which remain when the charge has arrived at the point of desired decarburization. For different mixtures of pig iron a slight difference in the appearance of the indicating green lines is noticeable at this point; and to secure with the same mixture a desired slight difference in the character of the steel produced in two different blows, proper allowance must be made, on the other side, of a certain degree of brilliancy of the green hues.

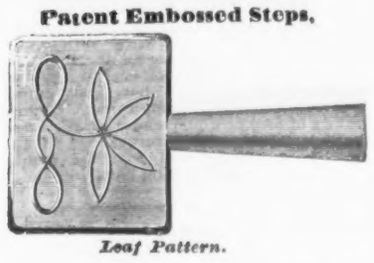
Purification of Water.—Prof. Gustav Bischof, of the Andersonian University, Glasgow, has patented an invention which relates to the construction of filters and preparation of minerals for purifying water. In the improved construction of filters a dished bottom is provided under the ordinary perforated bottom, separating it from the receptacle for the filtered water. A bent pipe leads from this dished bottom to the exterior, where it is stopped by a cock or plug; and a small hole in the bent pipe gives passage for the filtered water to the receptacle, the hole being so adjusted in size as to prevent a rush of water through the filter when a quantity is withdrawn from the receptacle. The bent pipe serves also to discharge the water used for cleaning the filter. The porous balls or slabs ordinarily used for filtering are impregnated with a solution of a salt of iron, and the ferrous oxide of iron is precipitated in their pores by impregnating them with an alkali or alkaline carbonate. This oxide becomes by exposure hydrated ferric oxide, which has a purifying effect on the water, and which may be directly mingled with the filtering materials.

Cleaning the Tubes in Tubular Boilers.—R. Weinlig, of Magdeburg, recommends the following apparatus for sweeping the tubes in locomotive and other tubular boilers. A copper tube about one-fifth of an inch in diameter, and contracted a little at one end, is provided with a wooden handle, and also with a hole where steam may be introduced through a rubber tube. The handle should be a yard long or more, the copper pipe long enough to reach through the fire box or smoke chest and project a short distance into the tubes to be cleaned. The fireman takes the wooden handle under his arm, inserts the pipe into a tube, admits the steam by means of a suitable stop cock attached for that purpose, and then rotates the tube around the side of the tube. The escaping steam cleans the tube in a short time, and in a very convenient manner, without disturbing the working of the boiler, or exposing the fireman to heat, smoke or dirt.

A deposit of ore that promises to be most valuable has lately been discovered in the vicinity of Uniontown, Western Pennsylvania. The ore is in three seams or veins, aggregating about twenty eight inches thick, and is supposed to underlie the entire Connellsville coal vein. Its character is cold short, though not extremely so, and works very easy in the furnace. It has been tried at the furnaces in that region, and has increased their yield fully fifteen per cent. With a mixture of four-fifths of this ore and one fifth Lake Superior, a good strong neutral iron can be made at a very low cost.

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.

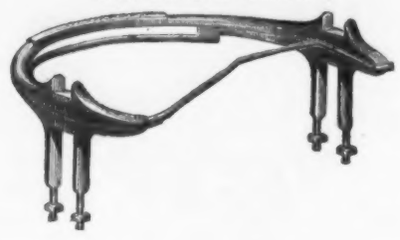


Leaf Pattern.

King Bolt Yokes.

Established 1850.

No. 6 Fifth Wheels.



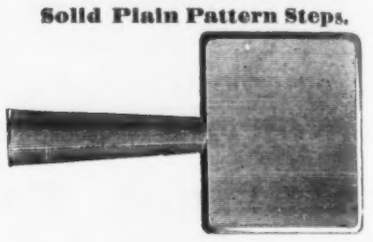
1871 Pattern Shaft Couplings.

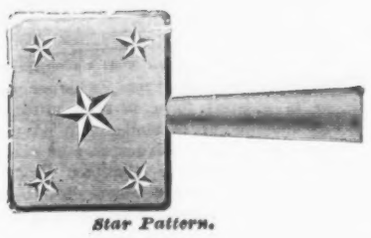
Patent Cross Bar Steps.

Upper View.

Lower View.

Solid Plain Pattern Steps.





Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.

MANUFACTURERS OF A LARGE VARIETY OF FIRST-CLASS

FORGED CARRIAGE IRONS.

Send for Price List.

FORT PLAIN SPRING & AXLE WORKS,

CLARK, SMITH & CO.,

Green Jacket Axles. FORT PLAIN, N. Y. Fine Carriage Springs.

MANUFACTURERS OF

English and Swedes Steel Springs, and Iron and Steel Axles.

Execute orders promptly for

Black, Bright, Tempered and Oil Tempered Springs,

ny Pattern or Style. Also for **AXLES of any description, from a COMMON LOOSE COLLAR to the FINEST OF STEEL.**

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved hinery, we defy competition.

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CARRIAGE BOLTS.

Buy the Best.

Clark's Patent Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not urn in its place.

MANUFACTURED BY

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Also Manufacturers of

Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, &c.

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MANUFACTURERS OF

SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws, Parallel Bench Vises, Sash Pullies, Ho House Pullies, Composition Cocks, Bench Screws, Vise Screws Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and Genera Hardware.

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HOOPES & TOWNSEND,

Manufacturers of

MACHINE & CAR BOLTS,

Cold Pressed Square & Hexagon Nuts,

Washers, Rivets, Wood or Lag Screws, Chain Links, Truck and Car Forgings, Bridge Bolts, Bridge Forgings.

IRONS AND RODS FOR BUILDINGS.

1330 Buttonwood Street, PHILADELPHIA.

CONCORD SPRING WORKS,

J. PALMER & CO.,

Manufacturers of

CARRIAGE SPRINGS,

Superior Temper, Warranted.

CONCORD, N. H.

Philadelphia Star Bolt Works.

"STAR"

Carriage and Tire Bolts,

NORWAY IRON,

Button Head.

QUALITY GUARANTEED.

Trade Mark.

IXL

Carriage and Tire Bolts,

CHARCOAL IRON,

Beveled Head.

QUALITY UNSURPASSED.

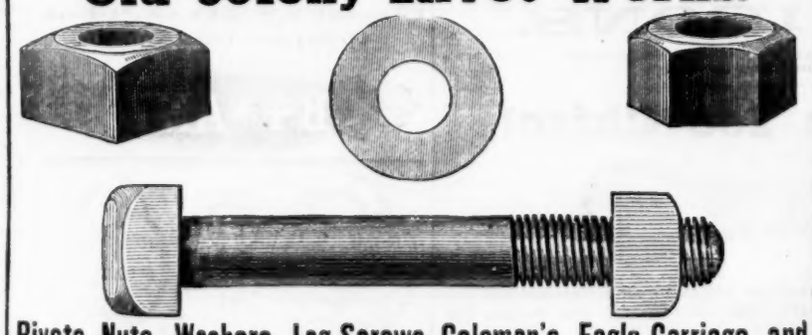
The Celebrated "STAR" Brand of Axle Clips.

Blank Bolts, Wood Screws, Square Head Bolts, Plow Bolts, &c., &c.

Our IXL Bolt is made from approved brands of Iron, and is equal in every point of appearance to the regular Philadelphia Carriage Bolts, being made on the same machinery, and the quality is not surpassed by any bolt of like grade in the market.

TOWNSEND WILSON & HUBBARD 2301 Cherry St. Philadelohia Pa.

Old Colony Rivet Works.



Rivets, Nuts, Washers, Lag Screws, Coleman's Eagle Carriage and Tire Bolts, Axle Clips, Felloe Plates, Shaft Couplings, Stove and Machine Bolts, Driling Machines, Tire Benders,

&c. Full stock constantly on hand. **Warehouse, 116 Chambers St., N. Y.**

ESTABLISHED 1857.

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MANUFACTURERS OF

Carriage Springs & Axles

DAM, NO 3 WATER ST, **Gardiner, Me.**

ALL GOODS WARRANTED.

ARMS, BELL & CO.,

Manufacturers of

Carriage, Tire & Square Head Bolts.

Cold Pressed Nuts and Washers, Etc.,

YOUNGSTOWN, OHIO.

Price lists sent on application.

THE READING BOLT & NUT WORKS.

J. H. STERNBERGH,

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Manufacturer of all kinds

Machine Bolts, Bolt Ends,

RODS for Bridges & Buildings,

HOT PRESSED NUTS,

Washers, Coach Screws, Refined Iron, &c.

Manufacturing my own stock of iron, I am able to control quality, and fill orders promptly, with a very superior article, at the lowest possible price. Send for Price List.

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J. AUSTIN & CO.,

168 Fulton Street, N. Y.

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Patented July 9th, 1872.

PATENT IMPROVED STEAM TRAP

The only self-regulating Steam Trap in the world. For full description send for circular to

A. L. JONES,

Steam Heating Establishment, 51 S. 4th treet Philad

The Iron Age.

New York, Thursday, February 25, 1875.

DAVID WILLIAMS - *Publisher and Proprietor.*

JAMES C. BAYLES - *Editor.*

JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the different editions of *The Iron Age* being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

Our rates of subscription will therefore be as follows:

Weekly Edition.....$4·50 a year.

Issued every THURSDAY Morning. Contains full Trade Reports for the week, brought up to the close of business on the previous day.

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Issued the FIRST AND THIRD THURSDAY of every month. Contains a full Review of the Trade for the previous half month.

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Great Britain	6 00	.....	3 00	.....	1 50
France	7 00	.....	3 50	.....	1 75
Germany	8 00	.....	4 00	.....	2 00
Prussia	8 00	.....	4 00	.....	2 00
Buenos Ayres	8 00	.....	4 00	.....	2 00
Peru	6 00	.....	3 00	.....	1 50
Belgium	8 00	.....	4 00	.....	2 00
Mexico	6 60	.....	3 30	.....	1 65
Sweden	8 00	.....	4 00	.....	2 00
New Zealand	8 00	.....	4 00	.....	2 00
Brazil	6 60	.....	3 30	.....	1 65

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CONTENTS.

The Second Geological Survey of Pennsylvania.

No work of greater importance to the iron trade of the country at large has lately been undertaken, than the Geological Survey of the State of Pennsylvania, now in progress under the direction of Prof. J. P. Lesley. The first survey of the State was made thirty years ago. Since that time very important discoveries have been made, among which may be included those of the bituminous coal field of the South-western portion of the State; the discovery of petroleum and its introduction into commercial use; and numerous and valuable discoveries of iron ore in various parts of the State. During these thirty years the progress in the various industries; the demand for suitable ores and fluxes for reduction into iron of better quality than previously made, and of steels of various grades; the manufacture of coke by improved processes; the production of illuminating and lubricating oils from crude petroleum, as well as of all the aniline dyes; the reduction of copper and nickel ores, and in many other branches of profitable industry, has been such as to require a thorough knowledge of the mineralogical condition of the area of the whole State. It was, however, only under a very considerable pressure from all parties, that the State Legislature appropriated in 1874 a small sum for the establishment of a commission under which a thorough and intelligent geological survey should be made. This commission is composed of prominent citizens serving without pay, and the professional charge of the survey is confided to Prof. J. P. Lesley, a member of the first survey, whose scientific knowledge and devotion to the work specially fitted him for the position. In his last annual message, Governor Hartranft alluded to the thorough character of the work being done by this survey and its importance to the citizens of the State, as well as to the whole country. That this allusion was based on good grounds is clearly evident from an abstract of Prof. Lesley's "Report of Progress of the Second "Geological Survey of Pennsylvania in "1874," just submitted. The report has not yet been issued, but as an earnest of the very important information it will furnish, such extracts from the introduction by Prof. Lesley, as we have space for, are here given. We shall refer more in detail to the report in future, and shall watch the progress of this truly important work with an interest which will be shared by all concerned in the iron and coal industries of the country.

The plan of this survey, adopted after careful consideration and such modifications as were necessary to come within the limits of the small appropriation made by the Legislature, was so comprehensive as to excite wonder that such an amount of work should have been undertaken by the director. It comprised as follows: (1) The occupation of five specially important and hitherto little studied districts of the State, requiring immediate attention; (2) The postponement for the present of work in the best known anthracite and bituminous coal regions; (3) The postponement for the present of systematic study of fossil forms on a large scale; (4) The establishment of a special laboratory at Harrisburg for the analysis of irons, steels, iron ores, and other blast furnace stock; (5) A special report, chiefly economical, on petroleum; (6) A special report on the mineralogy of the State, as at present known; (7) The publication of the season's work early in the winter and spring, in a series of separate, portable and cheap volumes, so as to make them practically useful to the largest number of persons, each volume containing the illustrations of its own text, in the shape of maps and wood cuts, and printed from stereotype plates for future use; and, finally, (8) The exhibition of type specimens of the collections of the survey in a cabinet in the rooms of the Board at Harrisburg. It will be observed that the first, fourth, sixth, seventh and eighth clauses of this comprehensive plan are all of prime and especial importance to the iron trade, and cover an amount of ground never before undertaken by any similar State Geological Survey.

Referring to the actual results attained thus far, Director Lesley states that as yet no work has been done in the anthracite region, but a section of the coal beds traversed by the deep shaft and boring at East Norwegian, near Pottsville, will be republished from the report of the president of the Reading Railroad Company for 1875, because its importance to the geology of the coal measures can hardly be overestimated. It completely confirms the accuracy of the knowledge obtained by the first geological survey of 1837-1840, while it throws new light on the precise shape of the sharp folds into which the coal beds have been complicated at the bottom of each synclinal trough. To those who are familiar with the earlier works of Prof. Lesley, and his eloquent language in support of his views of the formation of the various iron ores of the country in the *Iron Manufacturers' Guide*, published in 1859, the following quotation from the present report will be recognized as showing the same force and elegance of diction:

> There was no good reason to expect from the survey, in the first four months of its progress, any discoveries of importance. Discoveries were the natural and perennial fruits of the first survey, because nothing was really known about the geology of the State, and little about that of the United States. Every step made then was made on virgin ground; every observation had the charm of novelty; every mountain and valley was a riddle to be solved; every formation was strange to the eye, its contents unpredicted, its strata unclassified, their outcrops untraced. The region was as much a field for discovery as are the Territories of Colorada, Arizona, Utah and Nevada now.
>
> All this is of the past. The light of 30 years has rested on the State and revealed to geologists every feature of its structure. There seems nothing left for discovery. The business of the present survey is therefore critical examination, analysis, measurement, description and publication; the precise determination of qualities and quantities; the finer estimation of place, position, posture, mineral nature, metallurgical fitness and mining facility; the verification of what has been the subject of the comparative rough statements of past reports, and their authoritative restatement in a more detailed way, more intelligibly, and with all the corrections and additions which the business transactions of many individuals and incorporated companies enable us to make.
>
> In fact, however, questions of the highest imporance have never yet been answered; in spite of the successful efforts of the first survey, and in spite of all the mining and exploring that has been done in the last 30 years, every year reveals something unexpected. Discoveries are still possible; and to our astonishment some have been made in the four months of field operations just terminated.

Of these discoveries brief notice is as yet made, but enough to show that they are, some of them, of especial importance to our iron manufacturers. They are stated as follows, and duly credited in every case to the discoverer, a point which those at all familliar with the first survey and its publication will recognize with pleasure. Professor Prime is reported to have found the key to the cause, and therefore to the nature, of the brown hematite deposits of the limestone valleys. The value of this discovery will be tested during the year. A discovery of equal moment, and one affecting the mining value of a large range of iron ore deposits, has been made by Mr. Platt, which promises to settle the controversy respecting the cause of the universal northwest dip of the new red formation extending from New Hope through Bucks, Lancaster, York and Adams counties, and to explain the structure of a large part of Southeastern Pennsylvania. Mr. Chance has discovered a great fault at Port Clinton, on the Schuylkill, which is regarded as a marked event, and as throwing light on some perplexing portions of the geology of Pennsylvania. The extension of the outcrops of two coal beds already known to exist in one of the Allegheny Mountain ravines, near Altoona, has been traced for a long distance beyond the old openings, and this discovery is of importance, since these beds lie several hundred feet below the conglomerate, and may be of workable thickness in neighborhoods where they are much wanted. Other and purely geological discoveries of considerable importance are noted with the foregoing, as sufficient to encourage the hope that the present survey of the State will not be merely successful in its proper work of gathering and publishing a mass of useful discoveries made during the last twenty or thirty years, and never yet described and explained to the citizens of the Commonwealth whose common property they ought to be, but may make new and important discoveries of its own. This cannot fail to be the case if the same care in observing all facts and the same precise method of bringing them, by careful instrumental measurements, into their proper relations to each other, continue to govern the operations of the survey which the reports published this winter will show to have been the rule in the first field season. Prof. Lesley justly complains that, owing to the small appropriation available, several districts of the State have had to be entirely neglected. The district of Greene and Washington counties, in the southwest portion of the State, require a close survey, from which a map showing the depth of the Waynesburgh and Pittsburgh coal beds could be made. Butler and Beaver counties require a similar survey. The district of Westmoreland, Indiana and Fayette, one of the richest in the State, should furnish geological maps showing every important coal outcrop. The northern tier of counties is well worthy of laborious examination. Rich iron ore deposits are here believed to exist.

Of one subject the director of this survey speaks very decidedly, and his recommendation is worthy of the close attention of all interested in the proper exhibition at the Centennial of the collection of minerals made by this survey. It is undoubtedly eminently proper that a geological survey of Pennsylvania should be properly represented in the Centennial celebration of 1876. Prof. Lesley states that the collections of the past four months alone have amounted to many hundreds of specimens of minerals and fossils, and that no doubt twice as large a collection will be made in the season of 1875. Those collected in 1874 are being arranged for exhibition in the limited space afforded by the rooms of the commission at Harrisburg. The suggestion is made that an appropriation for a museum building at Harrisburg might be so worded as to include an order for the temporary exhibition of the collections of the survey in the Fairmount Park buildings in 1876. Beyond this it is quite evident, as the director says, that for a proper and complete exhibition of the geology of the State a special appropriation employing collectors whose entire time should be devoted to this object, and to the arrangement of the collection when made, is required. This department should be under the direction of the board, or better of an independent superintendent acting in harmony with it, that the actual work of the survey should not be hindered. The means at the disposal of the survey are too limited to permit any of its corps of geologists to turn aside from their field work to attend to any outside duty. This recommendation is of moment to the whole people of the State of Pennsylvania. Several of the Western States are taking active measures to properly present their geological and mineralogical condition at the Centennial. Missouri has lately concluded a thorough and scientific survey under Prof. Pumpelly, and even the impoverished States of the Southwest are appropriating funds to present the evidence of their mineral resources to the world in 1876. The great wealth and industry of Pennsylvania forbids the belief that a State of such varied mineral richness should not be properly represented at the same time.

But the director of the survey appeals directly to the iron trade of Pennsylvania, and which appeal we earnestly second when he says that "Among the most "important objects to be kept in mind is "the exhibition of the iron industry of "Pennsylvania, and some competent per-"son ought to be appointed by act of "Legislature to take exclusive charge of "this work—some one of high standing in "metallurgical science, as well as of good "executive capacity." This is indispensable to a proper representation of the iron resources of the State, and the trade of Pennsylvania cannot too soon or too forcibly impress its necessity upon their legislators; or, failing in the necessary legislative appointment and appropriation, to select the most fitting person, and by liberal contributions enable the fitting performance of the work. The Iron and Steel Association has just appointed a committee to supervise the same matter for the whole country. At this late period it is scarcely possible that this committee, although composed of very excellent material, can accomplish much. Unless, therefore, the matter is taken in hand promptly by individual iron masters, there is a prospect of the exhibition failing to do justice to the iron industry at large. In our judgment, this committee could best employ their influence in securing such action on the part of the several State governments as will lead to the appointment of local scientific commissions to carry out such plans of collection and classification as may be deemed most thorough and effective.

Railway Competition.

The great struggle now in progress between great trunk lines connecting the West with the Atlantic seaboard, shows how little is really to be feared from the so-called "railway monopolies" so long as they are left to themselves without special protection from national or State governments. There never has been, and probably never will be, a time when the great trunk lines could organize a combination to advance freight rates with the smallest chance of anything more than temporary benefit, to be followed by a reckless competition, in which each company endeavors to ruin its competitor by carrying passengers and merchandise at rates so low that the more traffic they have the more money they will lose. The result of the consolidation and extensions which have given us four trunk lines to the West has been to steadily lower the average cost of transportation from all parts of the interior to all parts of the seaboard, and the shippers of freights, as well as travelers by rail, have been greatly benefitted thereby, in increased speed and convenience of transit, and a more localized responsibility for safety to life and property. That these great competing lines can ever be consolidated under one management, or their management ever be directed by a common policy and a common interest, is scarcely supposable. The Pennsylvania, the Baltimore and Ohio, the Erie and the Central Roads, will remain competitors so long as a commercial rivalry exists betweeen Boston, New York, Philadelphia and Baltimore, and there is not capital enough in the country available for investment in transportation to buy up these lines, or prevent them from competing by fair and unfair means, for the lion's share of business and profit. The agents may meet in solumn council a dozen times a year, if they will, but the conditions of competitions remain unchanged, and the oftener they agree upon union scales of freight and passenger rates, the oftener will they fall out and underbid each other. For the present, at least, we are safe against railroad monopoly as affecting through freights, and with the increase of railroads in populous sections, it will not be many years until there will be but few points of importance from which the companies can charge more than *pro rata* tariffs.

Scotch Pig Iron.

Although the importation of Scotch pig iron into this country is steadily decreasing, owing to the very general preference given to the soft, tough native irons which are at once cheaper and better for general use, the statistics of that particular grade of British pig metal still have an interest for dealers and consumers in this country, and will probably continue to have for some time to come. No variety of pig iron has attained the same world-wide commercial importance, resulting in this case from the fact that the large stocks held in the Scotch markets have influenced the price of iron in all countries, and because the extreme fluidity of the Scotch No. 1 iron gave it a value in the manufacture of fine castings which for many years seemed to render it indispensable to founders on both sides of the ocean.

For many years past the statistics of Scotch iron have been kept with such care and accuracy, that it has always been possible to learn the precise statistical position of that metal. The returns issued by the Glasgow Iron Merchants' Association for the year 1874, are especially interesting, compared with those for former years. From these we learn that the production last year was only 806,000 tons, or less than for any year since 1865. This shows a falling off of 187,000 as compared with 1873, and of 400,000 tons as compared with 1870. Going further back, we find in last year's production a falling off of more than 285,000 from the average of the ten years 1864 to 1873 inclusive. In connection with these totals of production, it is interesting to note the records of furnace operations last year. In 1864 there were 134 furnaces in blast, making 1,164,000 tons of iron. In 1874 the average number in blast was only 96, producing, as stated above, 806,000 tons.

At the beginning of the year 122 furnaces were in blast, and at the close 121, the low average for the year being explained by the labor troubles which so seriously interrupted the course of the trade. When the miners' strike began in March, the demands of the unions were met with vigorous measures of defense on the part of the iron masters, and all but forty furnaces were blown out and remained so until the end of May, when a few were put in blast again. By October the number had increased to 121, and this number continued in blast until the end of the year. The production was further diminished by the fact that a number of furnaces were blown out and kept out for alterations and improvement. Their stacks have been hightened in most instances, and so altered as to secure the more perfect utilization of the furnace gases.

At the close of the past year the stocks of Scotch pig amounted to 96,000 tons, of which the makers held 62,000. This is 24,000 tons less than the stock reported at the end of 1873, and is the smallest reported at any time since 1856. The following is a comparison of the total exports of Scotch pig for three years, to the several consuming countries:

	1874. Tons.	1873. Tons.	1872. Tons.
France	25,803	33,322	45,422
Germany, Austria and Holland	130,983	217,810	300,539
Belgium, Denmark, Sweden and Norway	32,819	37,327	64,828
Russia	23,295	21,784	13,897
Spain and Portugal	8,830	6,843	6,413
Italy	19,030	18,070	15,118
United States	36,467	78,173	141,843
British America	20,964	23,792	76,971
East Indies, China, Australia, South America, &c.	16,227	15,551	5,117

From this it will be seen that there has been a very heavy falling off in the shipments to the United States, Russia, Germany and France. This year it is expected that the Scotch furnaces will increase their production to 1,000,000 tons. The following table shows the prices of Scotch pig in this market during the last week of each month in 1874:

	Coltness.	Glengarnock.	Eglinton.
January	$45·00 to	$42·50 to ...	$41·00 to 41·50
February	44·00 to 45·00	41·00 to 42·50	40·00 to 41·50
March	40·00 to 41·00	39·00 to 40·00	37·00 to 38·00
April	39·00 to 39·50	37·00 to 38·00	35·50 to 36·00
May	39·00 to 40·00	36·00 to 37·00	34·00 to 35·00
June	.... to	36·00 to ...	34·00 to ....
July	40·00 to	.... to ...	33·00 to 33·50
August	.... to	37·00 to	35·00 to ....
Sept'ber	.... to ...	37·00 to 38·00	35·00 to ....
October	40·00 to 42·00	39·00 to	37·00 to ....
Nov'ber	42·00 to	39·00 to	37·00 to ....
Dec'ber	39·00 to	37·00 to 38·00	37·00 to ...

Of the other brands of Scotch iron there has not been enough in the market at any time to establish their price here.

The bill which passed the House of Representatives on Tuesday last makes some changes of importance, chief among which is the restoration of the ten per cent. taken off of manufactured goods in the horizontal reduction made last year. To-day the bill goes to the Senate, and will probably pass that body without amendment, and receive the President's signature

The Statistical Position of Copper.

In previous articles on various aspects of the copper trade, which have appeared in these columns, we have called attention to the steady decline in the British production of that metal. This decline is shown as follows:

ENGLISH COPPER PRODUCTION FROM NATIVE ORES.

	Tons.		Tons.
1855	21,294	1865	11,888
1856	24,257	1866	11,153
1857	17,375	1867	10,233
1858	14,456	1868	9,817
1859	15,770	1869	8,291
1860	15,968	1870	7,175
1861	15,331	1871	6,280
1862	14,843	1872	5,703
1863	14,247	1873	5,240
1864	13,302	1874*	5,000

* Estimated.

While this rapid decline was going on in England, the production in Chili expanded in a still more striking manner, as shown by the following table of

EXPORTS OF COPPER FROM CHILI.

	Tons.		Tons.
1855	20,250	1865	48,327
1856	21,938	1866	44,820
1857	25,498	1867	44,634
1858	30,470	1868	43,669
1859	28,250	1869	54,867
1860	36,289	1870	49,139
1861	38,371	1871	41,200
1862	43,109	1872	46,337
1863	32,540	1873	42,165
1864	47,500	1874*	48,500

* Estimated.

Queensland (Australia) has, in a small way, also made some noteworthy progress:

COPPER PRODUCTION AND EXPORT OF QUEENSLAND.

Production.

	No of Mines at work.	Quantity of ore raised.	Quantity of Refined Copper produced.
		Tons.	Tons.
1864	2	2,512	89
1865	2	1,415	449
1866	2	2,835	604
1867	3	3,990	521
1868	3	6,571	1,235
1869	4	8,268	1,387
1870	4	8,936	1,523
1871	6	14,503	2,490
1872	36	19,361	2,448

Export.

	Quantity of Smelted Copper—Tons.
1871	2,555
1872	2,886¼
1873	2,456¼

The returns of 1874 from the cape copper mining districts, Cape of Good Hope, may be roughly estimated at 9700 tons of ore, or, at 30 per cent. yield of metal, 2910 tons fine copper. The latest statement from the Colony brings the details of 30 weeks as follows:

1874.		Transported by Railway. Tons.	Yield. Tons.
May	2 weeks	385	823
June	6 "	1,067	822
July	4 "	625	822
August	6 "	960	827
September	2 "	400	917
October	6 "	1,078	898
November	4 "	700	888
Total		5,215	5,996
Deduct sent down by railway to shipping port		5,215	
Leaving accumulated at mines in the 6 months		Tons. 781	

While the Cobre Mines of Santiago de Cuba, the property of English capitalists, formerly very productive, have ceased to yield any copper since the Cuban insurrection has rendered the locality unsafe, the Rio Tinto Mines, near Huelva, in Spain, owned by rich London firms, promise a large yield within a year or two, and a fair prospect is held out by the Linguizzetta Mines (Corsica), purchased by an English company, the property covering 1600 acres.

Our own production has increased in about the same ratio as the English production has decreased, as will apppear from the following table:

COPPER PRODUCTION OF THE UNITED STATES FOR TWELVE YEARS.

	Lake Superior only. Tons.	L. S. and other sorts. Tons.
1863	5,803	6,473
1864	5,803	7,410
1865	6,250	6,811
1866	6,250	6,978
1867	7,321	7,773
1868	8,918	9,467
1869	10,892	11,858
1870	11,558	12,649
1871	11,479	12,546
1872	10,839	11,948
1873	12,893	15,572
1874	15,470	17,546

According to the estimates of Messrs. White & Haskell, of this city, the prospects for the current year, and up to June 1, 1876, with regard to both the production and consumption, may be summed up as follows:

		Lbs.
Stocks—Jan. 1, 1874 (Lake Co's Dealers and Speculators)		7,000,000
Manufacturers		2,000,000
		9,000,000
Production for 1874.		
Cal. and Hecla	about	20,000,000
Quincey	"	2,700,000
Central	"	1,700,000
Atlantic	"	1,400,000
Phœnix	"	1,400,000
Franklyn and Pewabic	"	1,200,000
Cliff	"	1,150,000
Copper Falls	"	1,000,000
Osceola	"	750,000
Aliouez	"	700,000
Other Lake Co.'s	"	2,000,000
		34,000,000
Tennessee, Baltimore and other Atlantic smelters		5,000,000
Consumption for 1874	lbs.,	27,000,000 48,000,000
Exported in 1874	"	9,000,000
		36,000,000
Stock—Jan. 1, 1875		12,000,000
Of which Lake Co.'s Dealers & Speculators held		10,000,000
Manufacturers		2,000,000

On the data thus accessible these gentlemen venture the following estimates for the current year:

	Lbs.
Stocks Jan. 1, 1875	12,000,000
Production for 1875 (Lake Regions)	34,000,000
" " (Balt., Tenn., etc)	4,000,000
	50,000,000
Consumption for 1875 (12 mos. at 3,000,000 per month)	36,000,000
Stock—Jan. 1, 1876	14,000,000
Add probable arrivals overland by rail from Lake Regions, from Jan. 1, 1876 to June 1, 1876	1,000,000
Add for same time, production of Baltimore and Tennessee, which will be available for consumption	2,000,000
	17,000,000
Consumption Jan. to June 1, 1876	15,000,000
Stock—June 1, 1876, (when new copper year commences.)	2,000,000

The estimate of three millions of pounds per month as the consumption of the country is based upon the average of the past three years, which is very fair, considering the small consumption last year. In consequence of this small consumption the season opens with very light stocks of manufactured goods, and any call for these goods must bring about an active demand from the manufacturers for the raw material. As to production, it is probable the figures above given are as nearly correct as possible. The large lake companies are not likely to increase their production much, if any, and such increase as may take place in the output of the Allouez and Osceola mines will probably be offset by the diminished or suspended production of other mines. The reports of large deposits of copper in New Mexico are probably true, but it will be a long time before copper from these sections will come into market. As we mentioned in a former article, the impression seems to prevail in England that we shall be able to spare them a considerable amount of copper. The above statistics and estimates, which we do not hesitate to accept with confidence, will do much to dispel this illusion, and for this reason we commend them to the attention of the metal trade.

Sheffield Steel.

Sheffield has long been called the steel metropolis of the world. Up to twenty years ago the manufacture of steel outside of Sheffield was so unimportant that it was said, with truth, that that city supplied all Great Britain with steel, and in great part the entire world. Since then Germany, France and the United States have become competitors. The first rival who really gave the Sheffield steel manufacturers any trouble was the far-famed Krupp, the well known Prussian ordnance maker. Krupp's competition, however, only referred to one branch of the steel trade, and that a peculiar one—the manufacture of large masses of steel for military purposes. In that department the British manufacturers had scarcely shown their usual enterprise, and it was not until they began to have their eyes opened to the reputation Herr Krupp was acquiring that they vigorously set themselves to keep Sheffield in the front in the manufacture of heavy masses of steel for warlike, as well as peaceful, purposes. France has recently stepped to the front in certain classes of steel; but the most rapid strides have been made by the steel manufacturers of the United States, who have succeeded in making all grades and qualities, from the finest tool steel down through all the grades.

It would be difficult to say when steel was first used. There is repeated reference in old works to its use among the ancients at very early dates. Swedish iron, with Russian, have long been in high repute for making steel, steel itself being simply a compound of iron and carbon or charcoal. The mines of Dannemora, in Sweden, enjoy the reputation of being the finest for producing steel. The first process to be noticed, in dealing with bar and shear steel, is to show how it is converted from iron into steel. The converting furnace is composed of two troughs, one at each side, the place for the fire being between and under them, and the whole being arched over to keep in and equalize the heat. Bar iron is cut into lengths and placed in layers, with charcoal strewed between each layer in the two troughs. Sand or loam is placed over them. This covering cakes together with the heat of the furnace, and excludes the air from the iron and charcoal beneath. The troughs contain from ten to twenty tons of iron. When everything is ready, the metal is thoroughly heated by fires which burn from sixty to seventy hours. At this point begins the process of conversion. Excessive heat forces open the pores of the iron, and gradually the carbon is absorbed by it; the iron in this way becomes steel. When the experienced workman knows that the metal has taken in sufficient of the carbon, the bars are taken out, and are called "blister steel," from the small raised portions which are left on the surface. After rolling, tilting or shearing, this steel is employed for many purposes where a very high degree of polish is not necessary. The same bars, put together, heated and welded under the tilt or a forge hammer, are called "shear steel," which is again termed "double," "single," or "half," from the number of bars which have been joined or "married."

Let us now proceed a step further—to cast steel. This discovery is 134 years old, and is indissolubly associated with the name of Huntsman. The inventor of cast steel—Mr. Benjamin Huntsman, of Handsworth, near Sheffield—enabled the manufacturer to dispense, to a very large extent, with shear steel. The discovery was a most important one, and curious stories are told to this day of the efforts made to pierce the privacy of Mr. Huntsman's premises. The discoverer knew the value of his exclusive specialty, and for a long time he baffled the devices of the most unscrupulous and envious who sought to secure his secret. His workmen were true to him, and they would never have wilfully revealed his valuable invention. It is said that late one wintry night a poor wretch, scantily clad and shivering in every limb, crept up to Mr. Huntsman's premises, and entreated the men to let him warm himself inside. They were moved to admit him. In a few moments, on the floor of the workshop where the process of casting steel was proceeding, the pitiful wanderer appeared to be fast a sleep. The men went on breaking the bars of steel into small pieces, mixing them with manganese, putting all into crucibles like the jars used by the "Forty Thives" in the fable, and then placing the jars in the melting holes. The secret was out. The treacherous fellow was a rival who had in this unmanly way gained possession of the secret. So runs the story. It is certainly true that the speciality of cast steel was soon very generally known. As practised now it differs very little from the original method. After the bar steel has been treated as we have described, it is taken to the furnaces, which are holes three feet deep in the floor of the casting room. Coke fuel is used to make the furnaces intensely hot, and then the fire clay crucibles (or jars) containing the steel are lowered into them. In three hours a workman—his legs protected with saturated sacking or other shield—pushes aside the lid, and discloses a glowing mass, emitting a stream of intense heat. While strangers cannot approach within several yards, the workman looks down with unwavering eye; with huge iron pincers he grips the crucible, lifts it out, and the liquid metal is carried to the molds. When the crucible is turned on one side there flows a thin, very white stream of molten steel. At night the process is very beautiful, each stream of white steel shooting out brilliant coruscations. The steel is cooled in the ingots, after which it is tilted or rolled, and then used for purposes which require superior quality, where a fine finish is needed.

Bessemer steel is the most modern invention of any magnitude. It was the invention of Mr. Henry Bessemer, one of the most remarkable men of this age in the department of applied arts—his Bessemer saloon steamer, to obviate sea sickness in the channel passage, being his latest discovery. The process accomplishes most wonderful results, and, like all really great discoveries, is exceedingly simple. Formerly the time required for making bar steel, reckoning from the time when it was put into the furnace till it was cool enough to take out, was from fifteen to twenty days, and then another three hours were required, as we have seen, to change the bar into cast steel by the Huntsman process. Now, having looked on that picture, look on this. By the Bessemer process crude iron can be changed into steel in twenty-eight hours. The process may be briefly described, as we have seen it repeatedly, the last occasion being when the Grand Duke Constantine, of Russia, and *suite* were at the Cyclops Works. The illustrious visitors were as much amazed at the Bessemer process of making steel as at anything they saw in these vast establishments. A vessel of strong boiler plate, oval shaped, is lined with a powdered stone called "genister," found in the neighborhood of Sheffield. At the top of the vessel there is an aperture for pouring the metal in and out; at the bottom there are inserted seven tuyeres of fire clay, each having seven holes in it, and through these a blast from the engine enters. This vessel, though it contains several tons of metal, is constructed so that it will readily swing about in any direction required. It is first thoroughly heated with coke fuel. The pig iron has been melted in an adjoining furnace, and the converter (the vessel alluded to) is turned on one side, and the iron poured in through the aperture at the top. The converter is then righted, and the blast having been turned on into the interior through the holes in the bottom, a most powerful combustion takes place. The fire, increasing in intensity, causes a series of miniature explosions of sparks and flames; while a very pale and beautiful light illuminates the building. Then the vessel is swung down again, and the molten metal shoots forth a shower of brilliant sparks, which have all the beauty of fire works on no inconsiderable scale. The different colors and shades blending together make the spectacle most attractive to the spectator standing on one side, clear of danger. The workman, watching for the moment that the metal is ripe, gives the signal, the vessel is tilted forward, and he puts in charcoal pig iron, containing the required proportion of carbon. This carbon combines with the mass of molten metal, which then becomes steel. The work being finished, the Bessemer steel is run out, poured into a large ladle, and afterward deposited in the ingot molds, awaiting the uses to which it is to be applied.

Before steel can fairly be made into cutlery, tools, or the various other articles for which it is used, it undergoes the processes of rolling or tilting, both of which we have frequently been much interested to watch. In rolling, workmen may be seen pulling the red-hot bars of steel out of the furnace, using iron pincers for the purpose. Large rollers, revolving by steam power, receive the bars, which, passing through with a peculiar hiss, as if they resented the squeezing, have the pores of the steel closed, and take a more perfect grain. At each side of the rollers stands a workman to turn the bar after it has passed between them. The steel is rolled in flat sheets for saws, shovels, plates, and all articles which have a broad surface, and into circular rods for wire, needles and similar articles. The tilting process is simply hammering, but as now conducted at the great works is a striking sight. Tilting is intended to still further improve the steel for such fine purposes as razors, knives, scissors and general cutlery. Both processes are conducted amidst the most deafening noise, the "whuff, whuff," of the steam hammer being one of the sounds which strikes every stranger who enters Sheffield by road or rail, by day or night. Large hammers are fastened to huge lengths of timber. There are "tilt" and "forge" hammers, precisely alike, except that the forge are heavier and larger. The hammer is of iron, with a piece of hard composite metal fastened on the under part, where it strikes the steel. Water is kept pouring on the framework to keep it cool. The workman skillfully guides the steel under the hammer, moving it dexterously so that the blows shall be evenly distributed over the whole surface. A number of bars are welded together when necessary. A forge hammer delivers about 150 strokes per minute, and a tilt hammer twice as many. All manageable masses of steel are subjected to the tilt and forge hammers, to get them to the required size and consistency. For very large work the Nasmyth hammer is used. This wonderful invention has been productive of grand results in steel. The principle is too well known to require explanation, as the steel workers have complete command over the monster, regulating its blow so nicely as to make a two-ton delivery crack a nut or compress a mighty weight of metal.

The Sheffield steel trade is the back bone of Hallamshire industry. Sheffield swears by her steel even more than by her "plate." Touch Sheffielders on that point, and you do most grievously offend them. They have certainly shown a remarkable integrity in keeping up the quality of their article. The manufacturers have consented to lose contracts, in not a few profitable markets, rather than supply an article underneath the true Sheffield standard. The production of steel for tools, cutlery, springs, needles, pens, wire, files, saws, &c., &c., was for a long time the staple trade of Sheffield, and is still followed by all the leading firms. The more modern branch of the steel trade is the working of large masses and forgings for special purposes, for which steel has only recently come into favor. All the world knows how Sheffield steel works in tools and cutlery, but all the world does not know that when crinoline was in fashon Sheffield supplied the wire in which the ladies encased themselves. For a long time Sheffield produced all the crinoline steel that was used—the manufacture even as far back as twenty years ago being about 12,000 tons per year. France, Germany and America became competitors, but they did not seriously diminish the output. It was exported in various shapes, from raw steel to the made up skirts, to the various kingdoms on the Continent, to the colonies, and, indeed, to every portion of the civilized world, and to not a few of those parts of which Sidney Smith described the fashionable attire as "a judicious mixture of feathers and nothing." These primitive sisters came to crinolines—at all events, crinolines came to them. The great steel pen trade, for which Birmingham has a splendid speciality, is largely indebted to Sheffield. All the raw material is made at Sheffield, the quantity per annum reaching to thousands of tons. How many pens would a ton of steel make? People ask, where do all the pins go to? It would be quite as interesting to know where all the pens go to.

The wire manufacture is one of the most interesting in steel. For the general kinds of wire the steel, having been "softened," is reduced by rolling to a quarter of an inch in thickness; it is further reduced by being drawn through dies, graduating in size down to the fineness of hair. From pinion wire the cog wheels used in watches and clocks are made; but the finest of all—finer even than the human hair—is the watch motion wire. Its price in weight exceeds that of gold. A single pound weight will produce a length of nearly nine miles. Then there is steel for ladies' stays and ships' stays, for telegraph wire, and for the strands of cables, and for countless other purposes, including needles, of which 5000 may be had wrapped up in a packet to carry in your waistcoat pocket. Steel springs for watches, steel ribs for the framework of umbrellas and parasols, and steel wire rope. The latter is now a very important branch of manufacture; a rope of wire, strand upon strand, containing 36 thicknesses of steel, is lighter and more elastic, as well as stronger, than iron rope.

The second, or heavy branch of the Sheffield steel trade, is that in which the most remarkable development has taken place. It is not so liable to fluctuation as the lighter branches. No freak of fashion—as when crinoline goes out—can suddenly all but extinguish an entire branch. Not a single traveler by rail goes the shortest journey but he is indebted to Sheffield steel. If the company is wise, the rails upon which the carriages run are Bessemer rails. The wheels of the railway carriages have solid steel tires—the use of which has prevented many a railway disaster. Still, if it had not been for the Bessemer process, the application of steel to the permanent ways of railway companies would have been long delayed. The Caledonian Railway were amongst the first to use steel rails. They found that while the "life" of iron rails rarely exceeded three months, steel rails were found at the end of a year to be nearly as good as new. Then there are cast steel locomotive double-crank axles, tender and carriage axles, single crank and other marine shafts, cannon blocks, jackets, tubes and hoops for ordnance and hydraulics, forged out of solid ingots of cast steel; solid castings in steel, not forged or rolled, for railway wheels (with tires in one solid piece, railway crossings, horn blocks, or check plates, and a multitude of other purposes. A branch of the Sheffield steel trade very little noticed is that of cast steel bells, carried on by Messrs. Vickers, Sons & Co. (Limited), at Brightside. This manufacture was commenced in 1855, since which time they have made thousands of steel bells for all parts of the world. They sent one to the International Exhibition of 1851, which weighed nearly five tons, and required the contents of 176 crucibles of steel poured into the mold without a moment's cessation. If the pouring ceased for one instant, cold would get in, and the bell would be worthless. Sheffield cast steel bells are to day ringing amid the frosts and snows of Russia and Canada, where the cold is so intense that bronze bells would crack. This firm also make field pieces from a solid block of cast steel; although in the military branch the greatest manufacturers are Messrs. Thomas Firth & Sons, who have a remarkable reputation for ordnance. They supply the Woolwich authorities with the blocks, which are pierced at the arsenal.

There are many branches of the steel trade, all interesting enough in themselves to form the subject of special articles; but we must close this article by mentioning the names which are associated with the history of steel making in Sheffield. At the head, of course, are the honored names of Huntsman and Bessemer; Messrs. Sanderson Brothers & Co., Limited; Messrs. W. Jessop & Sons (with branch establishments in Manchester, Paris, Canada, New York, Boston, Philadelphia, Chicago and other principal cities of America); Messrs. Cammell & Co. (Limited), the Cyclops Steel Works; Messrs. John Brown & Co. (Limited), the Atlas Steel and Iron Works; the Turtons, the Butchers, Osbornes, Burys, Wardlows, Cockers, Nicholsons, Pearces, Eadons, Fisher, Brittain, Seebohm, Becketts, Smith, Spencer, Turner and a host of others. To write the history of the steel trade is almost to write the history of Sheffield.

A Lesson in Geography.

The Rochester *Express* says: Hon. S. S. Cox needs a little coaching in his geography. In a recent speech in the House, in which he was arguing in favor of free trade, Mr. Cox made the following local allusion to Rochester and gross geographical blunder. He said:

"Go with me to Rochester, N. Y. You will find water-power in abundance, grinding wheat and making the best flour. That water, or a portion of it, by its specific gravity, turns a mill wheel. No one will deny but that it is cheap labor; it is simply nature in harness working for the welfare of men. It costs little to harness it, and a large loaf at less price is the consequence. But why should the water which comes from the Canadian side, unpatriotic water, unglorified hydrostatics, unstarred and unspangled specific gravity—be used to cheapen bread? Is it not foreign, and worse than foreign—British? And worse than British—provincially British? Worse than provincially British—French—British—Indian? And every consumer of the flour, if he be a patriot, should stop damming that water. He should tear out the water wheels, and insert in their stead steam engines made in Pittsburgh, to be driven by caloric from Lehigh coal; for this machine and caloric are produced on our own soil, and demand protection. They are such precious 'infants.'"

Now, Mr. Cox, if, when you were in Rochester at the Tweed Convention of 1870, you had been less absorbed in your political associations, and had taken a look at the Genesee River, you would have discovered that the water that turns our mill wheels comes from our Pennsylvania border, and not from Canada. Instead of coming from Canada, "unstarred, unspangled," and all that, it is on its way to Canada. Hence, it is not "provincially British," nor French, nor Indian, but a genuine American agent, springing from the hill-sides of our own State, and doing our own work.

Aliens to Hold Real Estate in Tennessee.

By a recent act of the General Assembly of Tennessee, aliens can now hold real estate in that State, either by purchase or devise, and dispose of the same as if citizens. This act has been passed in the interest of English capitalists, who desire to acquire titles to mineral and coal lands in that State. The following is a copy of the act:

WHEREAS, An enlightened public policy, looking to a speedy development of the resources of our State, especially its mineral resources, demands that our laws should be so shaped that every obstacle now obstructing the influx of capital and labor should be removed and the most liberal inducements compatible with the genius of our institutions offered to aliens as well as to native citizens to invest their money in our State, thus adding to our material wealth and resources; therefore

Be it enacted by the General Assembly of the State of Tennessee: That it shall be lawful for an alien, resident or non-resident, to take and hold property, real or personal, in this State, either by purchase, descent or devise, and to dispose of and transmit the same by sale, descent or devise, as a native citizen.

Be it further enacted: That in all cases where aliens, resident or non-resident, have heretofore acquired title to property, real or personal, in this State, in a lawful manner, said aliens, their assigns, heirs, devisees or representatives, shall hold and dispose of the same in the same manner as native citizens.

Be it further enacted: That section 2188 and sub-section, of the Code, relative to escheats, be repealed, so far as the same relates to aliens or the real estate of such, and hereafter the heir or heirs of an alien, whether resident or non-resident of the United States, may take any lands so held by descent or otherwise, as citizens of the United States.

Be it further enacted: That this act take effect from and after its passage, the public welfare demanding it.

The governor has signed the act.

Japanese Tariff on Iron.—It appears that the term "wrought iron," used in the Japanese tariff, has been explained to the foreign representatives at Jeddo to include T iron, angle iron, iron rods and bars, rails, plates, ferrules, hoops and hoop iron, upon which the duty is 3-10ths of a "bou" per 100 catties. All other articles in iron pay 5 per cent. *ad valorem*. No change has been made in the rates charged on pig iron, wire, &c.

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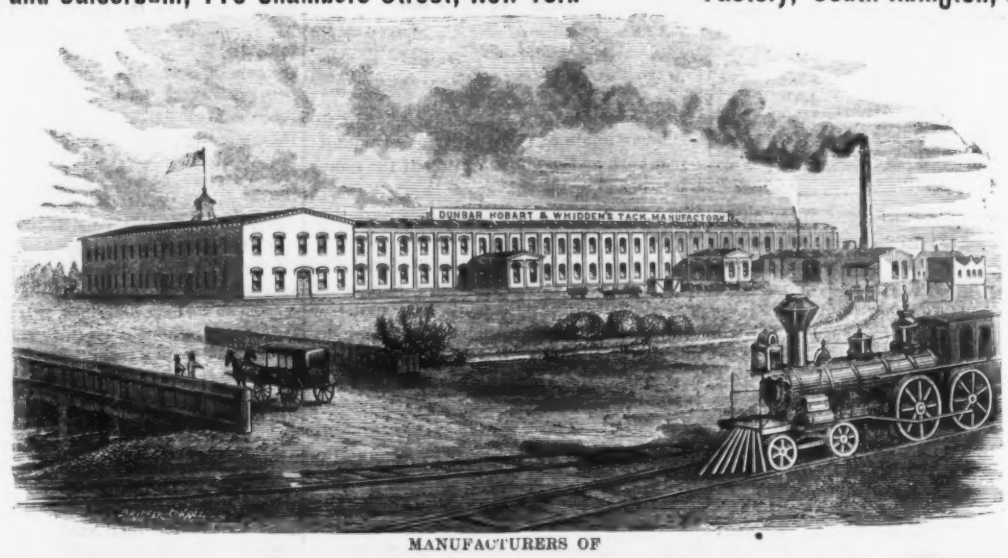

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The Lock-Out in South Wales.

From a letter in the London *Times* we gather the following on the lock-out in South Wales:

"No works that can be named undergo such frightful deterioration during prolonged idleness as collieries. In the best laid out pits at ordinary times large numbers of men are specially employed to keep the roadways and passages free from the interruptions which arise from incessant falls from roofs, or crushing in of the floor and walls from the superincumbent pressure; and in some pits this branch of the outgoing expenses amounts to a serious item in the accounts. But when pits are laid by for weeks, and, it may be, for two or three months together, to say nothing of the danger of flooding, the working became choked and impassable from accumulated falls.

"The ventilation is sometimes completely broken down, rendering the work of restoration a tedious, dangerous and expensive operation. In some pits, however, where, from the nature of the strata, roofs and floors are always treacherous, a protected idleness brings about so ruinous a condition of the workings as to render the expense of clearing and repairing for the resumption of work almost as great as the original cost of opening the mine.

"The prospect of this unwholesome and universal suspension of labor over such a wide tract of country is regarded by the middle classes with a feeling of dismay, and this feeling is shared by the working-classes, too, throughout the iron-works districts, in which the announcement of the masters' resolution was received with consternation. Under the circumstances, a powerful sympathy is felt for the iron works' collieries and iron workers. The former were implicated with the whole body in the strike at the outset, but the decisive measures of their managers had the happy effect of producing a speedy conviction of the folly of their proceeding, and they promptly retraced their steps.

"The situation is critical in the extreme. The sacrifices of the masters must be prodigious, and such as only the wealthiest firms can bear with ease; but to the workmen and their wives and families it involves a period of great hardship and suffering. Certain it is that severe and distressing as in the privation which always prevails in thousands of iron-workers' homes, it will be as nothing in comparison with the miseries of a whole population deprived of the earnings of nearly 120,000 bread-winners at one time. Already the struggle has cost the workman nearly £300,000 in wages, and, if it assumes the form which the masters have determined upon, every week will cost them considerably more than £100,000.

"The withdrawal of these vast sums from circulation in the district is a fact which supplies its own commentary, but once the struggle begins it is impossible to conjecture how long it may last, since the conditions will be wholly altered. Everything now depends upon those men who maintain their resistance.

"In the distric of Merthyr the pressure has been so far felt as to induce many workmen to apply to the school board for a remission of the school fees; and the school board has decided to remit the fees temporarily, but to surcharge them to the respective parents for payment when the difficulty is over."

The Manufacture of Iron in Turkey.—Notwithstanding the advances made by the pioneers of industry, and the general thirst for information relative thereto, it is a remarkable fact that we still remain to a great extent ignorant as to the iron and steel manufactures of Turkey; but the little knowledge gleaned indicates a steady progress, and a desire to shake off some of the characteristic lethargy that has always kept the Turk a long way behind the times. It appears that the most important iron works in Turkey are at Somakow, in the Balkans, which contain about twelve blast furnaces, that turn out annually about 12,000 tons of wrought iron of excellent quality. At Raoutcha are other works, which also produce about 5000 tons of pig iron, while there are also works at Klissoura, Palanka and Riche, all of which are supplied from mines situated in the valley of Novada and Klissoura. These ores are a native oxide. Mines of hydrated oxide are worked at Karatova. In Bosnia and Servia iron mines are worked at Viehgrad, Voickilya, Bounovatz and Vissok, and deposits of iron ore are also known to occur at Maiedam, Nova Maiedam and Sari Maiedam. Some iron mines are worked upon a small scale by the Turkish government in Candia at Scyros and Trebizonde. The extremely backward state of the iron manufacture in Turkey appears, in a great measure, due to the want of internal communication and transport, the majority of the roads being as yet only wretched mule tracks.

Repeating Rifles for the Italian Army.—The Italian government is about to try an experiment hitherto new in European armies, if we except the semi-civic force of Switzerland, and one that may possibly bring about a large change in tactics. The Vetterli "repeating" rifle, which is about to be supplied to certain Italian regiments, carries eleven reserve charges in a cylinder placed like a sort of false barrel under the real one. It may be used as an ordinary piece, without any reference to this stock of extra ammunition, which is then locked off; but, by moving a simple boltpiece, the trigger will discharge the whole twelve charges in rapid succession. The Swiss officers are said to be well satisfied with the practice made by the repeater; but their general view is that it is an arm especially suited for troops standing on the defensive. One battalion only of Bersaglieri at Turin is to receive it, and give it a fair trial. If it be approved of for such special troops, it is proposed later to supply all these rifle regiments, as well as the new Alpine companies of Chasseurs, with it.

New Patents.

We take from the records of the Patent Office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN BUCKLES.

Specification forming part of Letters Patent No. 158,350, dated January 5, 1875, issued to James Adair, of Killbuck Township, Pa.

The object of this invention is to make a buckle and keeper so that a strap with either

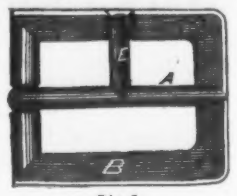

Fig. 1.

fixed or free ends can be quickly inserted and withdrawn; and it consists, first, in the combination of the movable tongue A, of Figs. 1, 2 and 3 in the accompanying drawing, and a hook or discontinuous rim, B, whereby I produce a buckle having an opening in one side for the ready passage of a strap, C, Figs. 4 and 5; second, in continuing in book form the

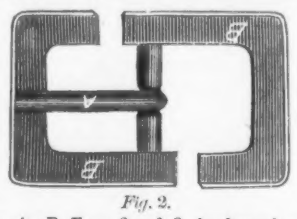

Fig. 2.

buckle rim B, Figs. 2 and 3, backward of the base of the tongue A, producing a keeper, D, having a side opening for the ready passage of the idle end of strap C, Fig. 4; third, in making the tongue A with a lug or projection, E, Fig. 1, to close the opening in the buckle rim B, so as to make the rim appear continuous, and to afford a place where the finger can be easily

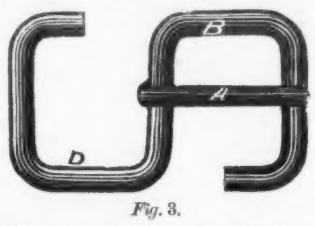

Fig. 3.

applied to raise the tongue A, which is operative with the discontinuous rim B, in the ordinary manner.

The discontinuous rim B is made sufficiently strong by an increased thickness or width of metal at the angles; but this rim may be made of a curved form, in which case the increased thickness of metal will appear in the proper place for such a well known form of hook.

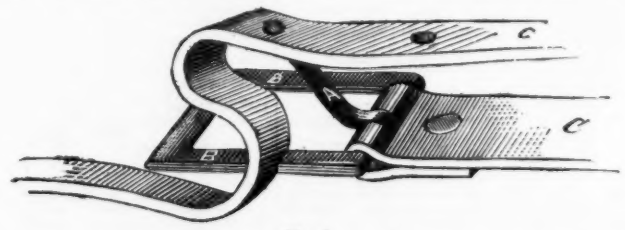

Fig. 4.

The advantages gained by the use of this buckle are obvious. Harness can be put on and off a horse very rapidly, even though the straps are wet, muddy and frozen, and the driver's fingers stiff from cold. Braces used in surgical practice can be quickly applied to and removed from a patient, while in numerous instances the ability to pass a strap into and secure it by this buckle before releasing the strap

Fig. 5.

from the hand, and while under tension, will prove of very great value.

Claim.—1. The combination of a movable tongue and a discontinuous rim or hook to form a buckle.

2. The combination of a buckle and a discontinuous keeper.

3. A buckle tongue having a lateral lug or projection.

IMPROVEMENT IN REDUCING ORES.

Specification forming part of Letters Patent No. 156,243, dated October 27, 1874, issued to Norman W. Wheeler, of New York.

The ores suitable for treatment by this process are those oxides which are found in the form of sand, or those which have been crushed to a like form, and are reducible by deoxidation.

Take of such ores and shower them down the inside of a vertical shaft, which is so constructed and worked or operated that the upper part is filled with a rising column of oxidizing flame or neutral flame, and the lower part is filled with a rising column of carbon or hydrocarbon gases—for instance, such a mixture of gases as results from the partial combustion of coal. The hight of that part of the shaft occupied by the flame should be such that each particle of ore will become greatly heated or fused during the time of its fall through the flame, and that part occupied by the carbon gases should have such a hight that such particle of heated or fused ore will give up its oxygen to the carbon gas while it is falling through such gas to a crucible or other proper receptacle placed at the bottom of the shaft. By making the carbon gas column of a greater or less hight, the metal may be simply deoxidized or carbonized at will, so that, by regulating the hight and richness of the carbon gas column, neutral iron, steel, or carbonized iron may be obtained from oxide of iron at will. The desired gas column may be produced and maintained in a reducing shaft, as above indicated, by connecting the base of the shaft by a flue with a Treveray furnace or generator (that it is to say, an apparatus in which a mixture of carbonic oxide, hydrocarbon, and nitrogen gases is formed by the incomplete combustion of coal) in such a way that the reducing shaft forms a chimney for the generator. The desired gas column may also be produced and maintained through a suitable attachment to a gas well, such as are developed by artesian borings in Pennsylvania and other parts of the world. The desired gas column may also be produced and maintained by injecting petroleum vapor by means of a steam jet or otherwise, or be derived from retorts fitted for the distillation of gas from coal or other fuel.

The desired flame column may be produced and maintained by opening a series of air holes through the walls of the reducing shaft, at the proper hight, so that the indraft of air through these holes will supply air for the complete combustion of the carbon gases as they rise to the level of the air holes, and the ignition and complete combustion of the gases produce the desired column of flame.

Hydrogen gas may be substituted for, or mingled with, the aforesaid carbon gases with good effect, on account of its affinity for oxygen and the great heat evolved by it when burned.

A form of apparatus suitable for the practice of the above described process is figured in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical section of the entire apparatus. Fig. 2 is a plan view, and Fig. 3 is a horizontal section on the line S S in Fig. 1.

A is the crucible, capable of being lowered or otherwise removed; B, a hollow vertical shaft of refractory material, mounted upon supports so disposed as to allow of the removal and replacement of the crucible. D is a gas generator, or fire place, used for the generation of carbonic oxide and hydrocarbon gases diluted with the nitrogen of the atmosphere by the incomplete combustion of coal or other fuel. The generator is connected to the shaft, B, by a flue in such a way that the reducing shaft, B, forms a chimney for the generator, D, and carries upward the gases generated by it. At the lower part of the shaft, B, is a series of air holes, K K, a sufficient number of which should be left open for the indraft of air to burn enough of the carbon gases to establish and maintain the requisite heat, which, however, will be partly produced by the combustion of the oxygen of the shower of ore with a part of the carbon gases. At the proper hight, depending upon the fineness and quality of the ore under treatment, and also upon the richness of the carbon gases, is another series of air holes, L L, for the admission of enough air to complete the combustion of the carbon gases as they rise to and above the level of the air holes, L L. At a proper hight above the level of the complete combustion air holes, L L, depending upon the length of flame attainable and the character of the ore under treatment, is a series of inclined feed holes, M M, opening into the reducing shaft, B, and into the hopper, F, and below the hopper, F, is a platform, E, for workmen. Gates are fitted to each of the feed holes wherewith to stop or regulate the supply of ore into the shaft. The reducing shaft, B, is surmounted by a chimney, C, to carry the products of combustion above the heads of the workmen upon the platform, E. The ore to be treated is to be elevated to the platform, E, and placed in the hopper, F, by workmen, from whence it will fall through the feed holes, M M, down inside the shaft, B, in a shower, when the gates are open.

Fig. 1.

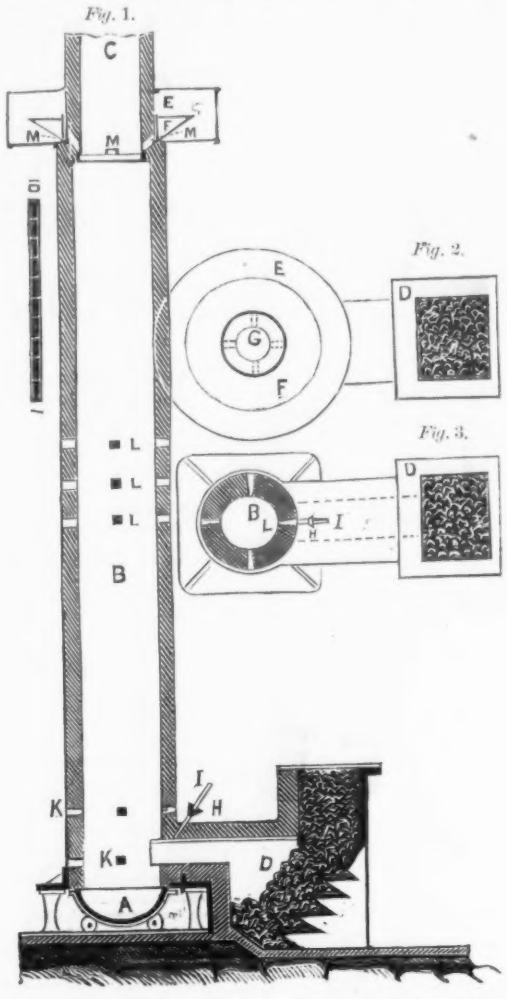

Fig. 2.

Fig. 3.

When constructing such apparatus, provide air holes at various hights, and furnish means of closing such as are not required for use, so that varying qualities of ore may be treated in the same apparatus, and different kinds of fuel be used.

When sulphurous ores are to be treated, it will be well to open larger areas of air holes than will be necessary for complete combustion simply, so that the flame may be rich in oxygen, and capable of burning away the sulphur or other oxidizable impurity before the ore shall have fallen into the carbon gases. An additional series of air holes near the top of the reducing shaft, B, will be of use in such cases, to furnish the required amount of oxygen without cooling the whole body of flame by over admission of air.

When it is desirable to reduce ferruginous zinc ores, the reducing shaft should be arranged as for the treatment of sulphurous ores, and such collectors attached to the chimney as are now used with roasting kilns for the purpose of collecting the zinc white. The first action upon the ore will be by the oxidizing part of the flame, whereby the zinc will be burned to peroxide and carried into the collectors, and the subsequent action upon the iron ore will be as hereinbefore described, so that the complete reduction and utilization of the metals may be accomplished by one heat and operation.

Should refractory ores require a greater hight of flame column than is readily attainable by the means hereinbefore described, the reducing shaft should be increased in hight, and additional supplies of carbon gases and air may be introduced above the primary flame; or a mixture of air and pulverized fuel may be forced into the reducing shaft to supplement and extend the effect of the primary flame. The gases and air may be heated by well known means previous to the entrance thereof into the reducing shaft.

If the ore under treatment requires the use of fluxes they may be finely divided, mingled with the ore, and showered down the shaft with it, or placed directly in the crucible A, and be reduced to, and kept in, a state of fusion by means of a blast of air through the pipe H, directed downward upon whatever may be in the crucible through the intervening carbon gases, care being taken that the mixed air and gas be ignited.

If a steam jet, through the pipe, I, be used to induce the air blast it is thought that the hydrogen resulting from the decomposition of the steam will be of benefit, the oxygen combining with carbon and leaving the hydrogen free to combine with the oxygen of the ore at a lower temperature, which will obtain above the blast jet.

The finely divided or comminuted ore may be heated before its introduction into the hopper F, if desired.

It will now be understood that finely divided ore may be placed in the hopper F and showered down the shaft, B, so as to fall first through a rising column of flame, and afterward through a rising column of carbon gases.

It is also obvious that carbon gases, such as described, may be made to pass from the generator into the base of the shaft, B, rise to a determinate hight therein, and made to undergo combustion by admission of air through the air holes, L L, so that when the apparatus is properly worked the reducing shaft B will have its upper part filled with a body of flame, and its lower part filled with a body of carbon gases, thus furnishing the requisite means for practicing the hereinbefore described process.

This process differs from those heretofore known for the roasting of ores by shower exposure to homogeneous hot gas, or to flame simply, and from those where the ore traversed through flues or ovens in a direction coincident with the current of gases, in that, to accomplish the object sought, the ore shower must fall, first, through a flame, and, second, through carbon gases, so as to be reduced during the time of its fall, and not simply roasted, desulphurized, or chlorinated.

Claim.—The process herein described for obtaining metals from the ores thereof, namely, the showering of granulated ore downward through a double atmosphere, consisting of a column of heating, or heating and oxidizing, flame of adequate hight for the preheating of the ore, over a column of reducing gas of adequate hight for the reduction of the greater part thereof, substantially in the manner and for the purposes set forth.

Metallurgy in Hainault.—The engineer-in-chief of this province of Belgium has just published a report, from which we derive the following figures: The number of blast furnaces is 46, of which 34 only are in work, yielding a total production of 34,000 tons of pig for mulding, and 358,000 tons for refining. The consumption of coke at these furnaces is 517,500 tons. The average is, therefore, 1320 kilogrammes per 1000 kilogrammes of pig-iron, which is not satisfactory. The coke furnaces of the province used 1,662,442 tons of coal to produce 1,203,200 tons of coke, a difference of 27 per cent. The number of puddling furnaces is 396 in work, and 100 idle, and of reheating furnaces, 132 working out of 180. The mills consist of 33 for raw iron, 58 for merchant iron, 9 for rails, 10 for sheet, and 12 for slit iron. The consumption of coal in the production of wrought iron is 597,410 tons for 208,408 tons of iron, 2229 kilogrammes to 1000 kilogrammes, or ton, of iron. Reducing the coke consumed in the blast furnaces to coal, it represents 1676 kilogrammes of coal per ton of pig iron produced. Add to this the coal burnt in the furnaces belonging to the works, namely, 128 kilogrammes per ton, we find that in the Hainaut, a ton of iron costs 1·804th of coal for its production. The transformation of pig into wrought iron, requiring 2229 kilogrammes of coal for 1000 kilogrammes of iron, it follows that the change from the state of ore to that of wrought iron, requires, on the average, 4033 kilogrammes of coal to the ton. The number of foundries in activity is 85, and they employ 97 cupolas in the production of 40,256 tons of castings, and consume 11,674 tons of coke, or 290 kilogrammes for 1000 kilogrammes of castings.

The combustibility of iron is a well known fact, but a Berlin experimenter has demonstrated the phenomenon in a manner peculiarly his own. He takes a straight bar magnet of some power, and sprinkles iron filings on one of its poles. These filings arrange themselves in accordance with the lines of magnetic force, and however closely they may appear to be placed, of course no two of the metallic filaments are parallel, and consequently a certain portion of air is enclosed as in a metallic sponge. The flame of any ordinary spirit lamp or gas burner readily ignites the finely divided iron, and it continues to burn most brilliantly for a considerable length of time, the combustion being, apparently, as natural and easy as that of any ordinary substance. If the experimenter with this operation stands on a slight elevation and waves the magnet to and fro while burning, a magnificent rain of fire is said to be produced.

The exports of railway iron and steel from Great Britain during 1874 were distributed as follows: 94,466 tons to the United States, against 186,300 tons in 1873 and 467,304 tons in 1872; 63,032 to British North America in 1874, against 54,521 tons in 1873 and 77,521 tons in 1872; and 624,939 tons to other countries in 1874, against 544,151 tons in 1873 and 400,861 tons in 1872. The totals are 782,437 tons in 1874, 785,014 tons in 1873, and 945,420 tons in 1872. It will be noticed that the total exports in 1874 were about the same as in 1873, while the exports to the United States were only one-half as large. This is a curious commentary upon the proposed advance of the duty for the purpose of excluding British iron from American markets. The comparison of the values of exports in the last two years shows a greater falling off. The total exports in 1874 were valued at £9,629,830, against £10,418,853 in 1873, and £10,225,492 in 1872.

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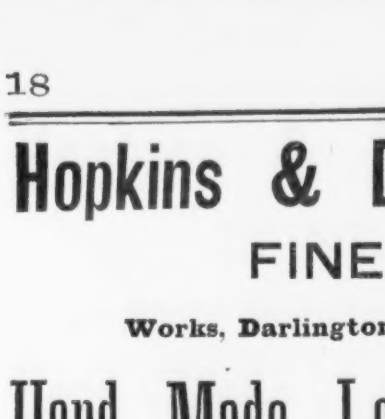

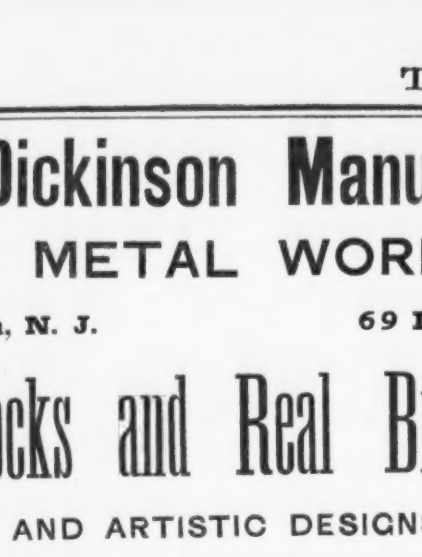

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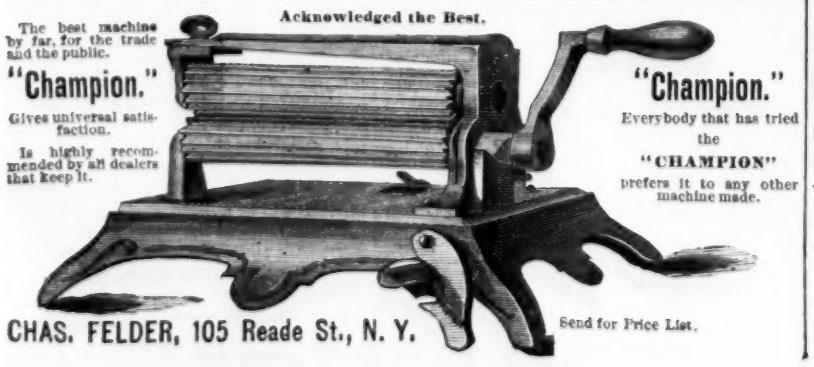

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N. J. Central R. R. at Elizabeth, N. J.
Grand Trunk R. R.
South Shore "
Cleveland & Pittsburgh R. R., Pittsburgh, Pa.
Hodge & Christie, Detroit, Mich.
H. P. Sanger, "
Rop & Co., "
Bay City Iron Works, Bay City, Mich.
John Carrier & Co., "
Key Stone Salt & Lumber Co., "

NAVY YARDS.

Brooklyn Navy Yard, Brooklyn, L. I.
Charlestown " Charlestown, Mass.
Portsmouth " Portsmouth, N. H.
Washington " Washington, D. C.
Mare Island " California.
Philadelphia " Philadelphia, Pa.
Westchester Spoke Works, Westchester, Pa.
King Iron Works, "
Buffalo Iron & Nail Works, Buffalo, N. Y.
Perry St. Steam Engine Works, "
Shoeuberger & Co., Iron Mfrs., Pa.
Dimint, Porter & Co., "
Moses Ellis, Iron Fdry, Keene, N. H.
Elm St., Planing Mill, Buffalo, N. Y.
Niagara Planing Mill, "
Elk St. Steam Bakery, "
National Steam Mill, "
Court St. Planing Mill, "
Godfrey & Clark, Paper Mill, Pittsburgh, Pa.
Houghton & Knieseer, Toledo, O.
F. D. Stone, Cleveland, O.
Riley & Robinson, Coopers, "
Brown & Knowles, "
A. C. Denison, Maine.
C. & E. Millliken, "
Lawrence Bros., "
Trent, Lang & Co., "
Cumberland Bone Co., "
Portland Brick Co., "
James Hobson, "
Hon. J. Lynch, "
Wm. L. Fisk, "
F. A. Pitcher & Co., "
Star Match Co., "
Warren Mfg. Co., "
Forrest Paper Co., "
Presumpscot Forge Co., "
J. S. Ricker, "
E. H. Tolman, "
J. W. Penney, "
C. B. Dwinell, "
J. S. Ricker & Co., Montreal, Canada.
R. Lewis, "
Printers Paper Mill, Lancaster, Pa.
Girard Tube Works, Philadelphia, Pa.
G. Berguer, "Daily Telegraph," Harrisburgh, Pa.
Reading Coal & Iron Co. "
Boiling Springs, "
Antietam Paper Co., Hagerstown, Md.
A. S. Kendall, Tannery, West Swanzey, N. H.
J. Simonds, Tannery, East Sullivan, N. H.
L. J. Colany & Co., Cotton Factory, Munsonville, N. H.
Francis Fisher, Tannery, Keene, "
J. Burnap, Tannery, Marlowe, "
Higbee & Co., Flour Mill, Belleville, O.
Junction Mills, Shelby, "
A. S. Parmlee, Liverpool, "
A. H. Moore's, North Riesgerville, "
Dick & Bliss, Stone Quarry, Grafton, "
F. M. Stock, Flour Mill, Hilldale, Mich.
Cleveland Rolling Mill Newburg, O.
Scofield, Chase & Co., Pipe Works, Cleveland, O.
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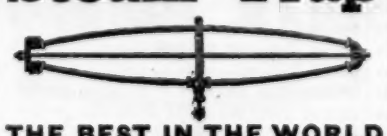

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The Construction of Gas Works.

At a recent meeting of the British Institute of Civil Engineers, Mr. H. E. Jones read a paper on the construction of gas works, from which we make the following interesting abstract: The subject of the paper was the consideration of what types of gas making appliances were cheapest in construction as well as most efficient in action. The site should be selected chiefly for facilities in receiving and delivering material by rail or water. Every section, of which the most important was the retort house with its contents, should be so constructed as to admit of extension without involving destruction. Opinions were divided, whether the house was best with the retorts upon the ground level, or on a "stage." The author had come to the conclusion, that when there was a ready sale for coke from the ground floor of the stage houses as fast as it was made, a saving of labor, as compared with a ground floor house, was effected; but not when the coke had to be stacked outside the house. A comparison of the manufacturing wages for the year 1873 of those metropolitan gas companies employing stage retort houses and others using ground floor houses, showed a saving by the former of 48d per 1000 cubic feet of gas sold. On the other hand, the cost of a stage retort house, complete with retorts and fittings, and having suitable coal stores, ranged from double to three times that of the simpler form of house for the same capability of production. The cost of the stage house was not less than from £16,000 to £18,000 per million cubic feet of gas produced per diem, or £8000 more than the ground floor house. This would require, at the usual rate of interest, £800 per year, to which must be added the wear and tear at £2 per cent. = £160, making an annual extra charge upon working of £960. Allowing a deduction for extra labor on coke, the net saving was probably about one-third of a penny per 1000 cubic feet of gas. Supposing the maximum annual make to be 203,670,000 cubic feet, the saving on this quantity would amount to £282, which fell short of the extra annual charge by £678. Of the various retorts the round form was undoubtedly the strongest and most enduring, and the oval the weakest; but the latter and the D shape were capable of working heavier proportional charges. The greater the number of retorts within one oven, and worked by one furnace, the greater the economy in fuel; as the surface of the enclosing walls, and *pro tanto* the loss of heat by radiation, were thereby reduced in proportion to the capacity for carbonization.

The effect of the high temperature at which coal was best carbonized was that, through the dip pipes, the liquid contents of the hydraulic main were subjected to a continuous blast of gas from the white hot sides of the retort. The stagnant tar, therefore, was boiled until its fluidity was gone. This produced pressure on the retort, causing loss through its pores, active deposition of carbon on its sides, and a constant choking of the ascension pipe, near the mouth-piece, especially, but more or less throughout its length, occasionally even implicating the H pipe. There were many propositions to remedy these stoppages, and to do away with the hydraulic seal altogether. Of these, none would bear comparison, for safety and effectiveness, with the contrivance they aimed at displacing. The fault lay not in the hydraulic seal, but in the condition of its contents. The problem to be solved was how to keep the tar in the hydraulic main sufficiently fluid. The author found that an extra length of eight feet of ascension and dip pipe, interposed between the retort and the hydraulic main, reduced the average temperature within the latter 36°. The deposit of pitch then ceased, and no further stoppages were experienced. There was little prospect of the intermittent process of carbonizing by manual labor being superseded by a continuous system actuated by steam-power. None of the suggestions with this aim had justified their adoption on a working scale. Even the modified advantage of substituting steam power for manual labor seemed difficult of realization. Of this last, a thorough trial at Beckton had ended in its being for the present abandoned. The form of the condenser was immaterial so long as it was extensive enough, and did not separate the tar and liquor until the desired minimum temperature was reached. This should be near that of the atmosphere, even in the depth of winter, to avoid condensation of naphthaline and loss of illuminating power in distribution. Of exhausters, the best, known as "Beale's," had a rotary action. The washer and scrubber were next considered. These removed the ammonia and such carbonic acid and sulphureted hydrogen as would combine with the water and ammoniacal liquor used. Washers were generally shallow, oblong boxes, with cellular passages sealed by liquor or water, through which the gas was forced or drawn in fine streams; they gave a more intimate contact between the gas and the liquid than the scrubber, but were open to the objection that they caused back pressure. The scrubber, on the other hand, did not work well with small quantities of water, owing to the difficulty of insuring equal distribution throughout its contents as commonly arranged. The scrubber was usually a cylinder, sometimes of extreme hight, filled with porous material, by means of which the gas was washed by ammoniacal liquor or by water; by these, and with reasonable care and entire exclusion of tar, fair results were obtained. The materials used in scrubbers were in themselves inert, and were subject to have their interstices filled by a deposit of tarry oil. The liquor was thus diverted, and established for itself distinct channels, the gas meanwhile taking separate routes through the mass of material, avoiding the contact desired. This defect was necessarily magnified in lofty scrubbers, where the liquor had to descend from 50 ft. to 70 ft. For the removal of ammonia, and at the same time to procure liquor of great strength, the author preferred scrubbers on a principle somewhat like that of the Coffey still. They were boxes of iron 20 ft. high, 10 ft. long, and 2 ft. wide internally, with longitudinal shelves of unwrought fir, 6 in. apart, extending alternately from one end of the box to within 6 in. of the other, so as to cause the water to traverse the whole length of one shelf before it descended to the next, meeting the gas flowing in a flat, wide current in the opposite direction. The washer or scrubber was an apparatus of great value, inasmuch as all purifying agents acted more energetically in a liquid form, and were cheaply and easily brought into contact with the gas without demanding manual labor.

The purifiers should be capable of holding such a bulk of material that its interstices might contain a considerable volume of gas, and reduce the velocity with which the latter were passed in contact with it. The capacity should vary with the density of the purifying material. With either lime or oxide of iron, there was a sacrifice of economy whenever the capacity of the purifiers, at any one time acting on the gas, was less than 4 cubic feet per 1000 ft. of gas purified per diem, and that so disposed that the aggregate depth of the material in lineal feet was not more than one-twentieth of the area in square feet. The author preferred to have on the outlet of each purifier to the clean gas main a valve sealed with fresh water. The great question of the day in purification was to remove the bisulphide of carbon. It had been ascertained that when sufficiently long in contact with an alkaline sulphide, this impurity was reacted upon. If, therefore, caustic alkali was submitted to gas foul with sulphuretted hydrogen, but free from carbonic acid, a sulphide was obtained, which reacted on the bisulphide of carbon. In this condition, however, lay the difficulty. Although alkaline bases had a higher affinity for carbonic acid than for sulphureted hydrogen, and were, therefore, capable of removing it preparatory to the process before indicated, their affinity for the latter body was considerable, and it was not easy to prevent sulphureted hydrogen being arrested, so as to vitiate the formation of sufficient alkaline sulphide in the succeeding purifier for the extraction of the bisulphide. From this cause results of an apparently eccentric and conflicting character were occasionally obtained. Absolute purity from bisulphide of carbon had not yet been attained, but so far this body appeared to be capable of restraint within objectionable limits.

Gasholders with their tanks were a portion of the plant which, next to retort houses, figured most prominently in a company's capital account, and therefore afforded the engineer scope for the exercise of economy in construction. The holders should be telescopic, developing a double storage capacity for the single expense in tank. The proportion of the hight of the holder to its diameter should be regulated by the maximum amount of pressure required, subject to the value of the ground occupied. At the same time a hight in each lift of less than one-fifth of the diameter was undesirable. Gasholders might be light in weight without sacrifice to their efficiency. The iron sheeting need not be thicker than No. 12 Birmingham wire gauge, weighing 4·38 lb. per square foot. The pressure of the gas within assisted in maintaining their shape; and the sides needed little framing beyond good top and bottom rings, where the guide rollers were attached, and a sufficient number of uprights to sustain the weight of the top sheets. No truss framing was required, as the sheeting might rest on a cheap scaffolding of wood when the holder was landed, and would be sufficiently sustained by the gas within when afloat. The author had frequently been inside gasholders inflated with air, and had noticed the trussing hanging from the distended sheeting of the top, being practically a burden instead of a support. However perfectly a roof framing might be adjusted, when the holder was lifted by internal pressure, its members remained rigid while the sheeting stretched, and never again fitted the framing. At ordinary rates of iron, gasholders of the kind described could be constructed, for sizes below a capacity of 300,000 cubic feet, at about £13 per 1000 cubic feet; above that size the cost diminished with the increase of capacity, until at 2,000,000 cubic feet £8 to £10 per 1000 cubic feet represented the cost. A holder for 2,350,000 cubic feet, which had a slight truss in the top, had been executed in 1866 for the Commercial Gas Company at so low a rate as £5. 13/ per 1000 cubic feet. The external guide framing should be strong enough to sustain the inflated holder, even under the influence of a hurricane. At the same time, the constituent metal could be disposed in forms developing, far more than was commonly seen, the strength due to the weight of iron composing its members. The author had been impressed by the elegance, and general fitness of the form to the purpose, exhibited by the guide framings of the original gasholders at the Bow Common Station of the Chartered Gas Company, designed by Mr. Croll, Assoc. Inst. C. E. Gasholder tanks had usually, where soil permitted, been built of either brickwork or masonry, well puddled round the walls and over the bottom. Portland cement concrete, in some cases without puddle, had been adopted latterly, notably by Mr. Livesey, M. Inst. C. E. Brick tanks, puddled, ordinarily cost £6. 10/ per 1000 cubic feet of capacity of the telescoped holder fitted in them, though the cost of the tank for the Commercial Company's holder was as low as £5. 5/ per 1000 cubic feet. A concrete tank constructed by Mr. Livesey had been completed at a saving of £2. 11/ per 1000 cubic feet, as compared with a brick tank of the same capacity.

The governor or regulator, as usually constructed, had a conical valve suspended in the upward stream of gas, actuated by a balanced gasholder, and was open to the objection that, having a flat base to the cone, the latter was disturbed and acted upon by the current of gas, much as a loosely fitting piston would be, and therefore required constant readjusting. To obviate this irregularity, a large throttle valve had been adapted for the purpose, which worked admirably. The ordinary pressure upon the system of mains ranged from between 1·0 in. and 1·5 in. head of water between sunset and midnight to 0·6 in. or 0·8 in. for the rest of the 24 hours. To secure economical distribution, the regulation of the pressure in the mains at all parts of the system should be under complete control; that pressure should be, as far as possible, uniform with the initial pressure, or, under a constant rate of variation from it. These conditions were best fulfilled by distributing the gas from a mean level between the extremes, having high and low pressure mains for supplying the lower and higher portions of the district, right and left, avoiding all duplication in their course, and the consequent multiplication of joints and surfaces of metal.

In setting the proportions of length and diameter in the arterial and subsidiary mains, the experience of the qualified engineer would be the best guide. Mr. Hawksley, Past President Inst. C.E., had rendered invaluable service by investigating the laws which governed the transmission of aeriform fluids through cylindrical pipes, and by determining, from experiment on a practical scale, the coefficient of friction for coal gas. The author was satisfied that mains and services could be laid practically free from leakage. If the condition of mains and services as laid could be preserved, no doubt leakage would practically disappear. Unfortunately, however, mains, once laid, were subject to disturbing influences, such as decay of material, subsidence of the soil wherein the pipes reposed, and in large towns, the vibration due to heavy street traffic, as well as to contiguous railways. There was no satisfactory reason, however, for the high average percentage throughout the country. In the district of the Ratcliff Gas Company, which surrounded the docks, and was consequently subject to vibration from the heaviest traffic, the total per centage of unaccounted-for gas, including other losses beside leakage, had, for two years, been within 6 per cent.; and the returns from various parts of the country indicated improvement in this direction.

As an argument for the importance of cheap construction, it was pointed out, that the maximum demand for gas extended only for about three weeks in the year, falling at midsummer by as much as two-thirds. The anomalous and varying rates at which gas was sold, not only throughout the country, but even within the limits of London, was explained by the varying proportions between the quantity of gas manufactured in each case and the amount of capital employed. The difference in the charge to the consumer was absorbed in meeting the higher charge for dividend which the company with the larger proportion of capital required. This difference no concentration or amalgamation could overcome; and the lesson taught to the engineer should be the importance of endeavoring, as far as in him lay, to develop the highest efficiency from the works with the lowest expenditure of capital.

Rules for Calculating the Speed of Wheels and Pulleys.

The following has been published before, and as it is simple and reliable we reproduce it:

PROBLEM I. The diameter of the driver and driven being given, to find the number of revolutions of the driven:

RULE.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the diameter of the driven; the quotient will be the number of revolutions.

PROBLEM II. The diameter and the revolutions of the driver being given to find the diameter of the driven, that shall make any given number of revolutions in the same time:

RULE.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions of the driven; the quotient will be its diameter.

PROBLEM III. To ascertain the size of the driver:

RULE.—Multiply the diameter of the driven by the number of revolutions you wish to make, and divide the product by the revolutions of the driver; the quotient will be the size of the driver.

Cutting Cold Iron and Steel with a Disc.—Considering the fact that for some years past Carnegie, Kloman & Co., of Pittsburgh, have been using a plain disc to cut large iron beams cold, and since its introduction there that many other American mills have been using it for the same or similar purposes, our English friends should not speak as in the item below. People not better informed might be led into error as to whom credit belongs for this new application of the disc, used nearly or altogether half a century ago for cutting saw teeth in *cold* steel and like purposes, as well as that above mentioned. "A method of cutting steel rails, recently introduced at the works of Sir John Brown & Co., in Sheffield, is based on the principle of the lecture experiment in which a piece of steel is cut in half by means of a disc of soft iron. By way of experiment, Mr. White, the manager of these works, had the teeth removed from an ordinary rail saw and the disc mounted on a spindle that could be driven at about 3000 revolutions a minute, which gave, as the disc was three feet in diameter, a peripheral velocity of over 27,000 feet a minute, or 150 yards in a second. Sixty pound rails were cut through in from three to four minutes, and the success of the machine is so thorough, and the economy so considerable, that a larger saw is to be erected as soon as possible."—*Rolling Mill Information.*

The Working Classes in Russia.

The St. Petersburg correspondent of the London *Globe* writes, under date Jan. 15, in the following strain: "The Christmas holidays are now over, and in the outlying districts of St. Petersburg, where all the manufactories are situated, workmen are now recommencing work, after having spent in drink all the savings of the past year. During the last fortnight the amount of money expended on vodsky and beer has been enormous, and perhaps more than three parts of the working population have been intoxicated. Most 'fabricks' ceased word on the 23d, and did not begin again till Jan. 2. The three days preceding the new year were not calendar holidays, but so many workmen were suffering from the effects of drink, and had still money left for a debauch on New Year's Day, that most masters preferred to keep their establishments closed till the holidays were entirely over. And when I speak of the holidays being entirely over, I do not mean that there are no more for a long while; on the contrary, there is a great holiday on the 6th, when the Neva is blessed, and there will be another half-dozen or so before the great Easter debauch comes round. These holidays are a great hindrance to industry. On an average one occurs every fortnight, but the Russian workman, although ready to strike rather than work on a calendar holiday of importance, is ever willing to work on Sundays. On holidays the drunkenness is so great that if a pay-day falls within a short time of one, masters will not pay their men till the eve preceding it, thus enabling the men to get rid of more money, and to return to work with fewer means for gratifying the taste for drink till next pay-day. The condition of a workman in St. Petersburg is so bad that it can hardly be worse. When a young man he is sent by his father from the village, perhaps a thousand miles away, to better himself at St. Petersburg. He tramps the greater part of the distance, and on his arrival obtains a job as a carpenter, or what not. After a time, tiring of this, he becomes a fitter, then a molder or a boiler maker, and afterward he may serve for a time as a *dvornick*, or even act as a laborer. Such transformations are so common as to become a byword among the foreign foremen employed in all 'fabricks' here. He has not the stability of an English artisan; he is, from want of training, very unskillful; he is lazy, and subject to fits of restlessness, which cause him to change one master for another with the facility with which he passes from one occupation to another. Perhaps he may just be adapting himself to a new pursuit when his father sends him an order to return home and marry some woman, whom, very likely, he has never seen before. He never thinks of disobeying, but demands his passport of his master and disappears for a month or so. Some morning he reappears, and resumes his work as though nothing had occurred. He lives the same bachelor life as he lived before, while his wife assists her father-in-law, and pines perhaps for the husband she may not see for years, or at the very most, not oftener than once a year. Or the workman may be taken for a soldier, and, in that case, the master may lose one of his best hands. The Russian workman has no conception of home. Of the tens of thousands of work people employed at St. Petersburg, hardly any bring their wives from the villages in the interior, and if they do, they make them go into service as servants. The workmen of each 'fabrick' form among themselves one or more associations, called 'artels,' which bear a great resemblance to mess on board ship. A certain number of men elect a chief, called a 'Starotta' who hires one or more rooms in a house, pays the rent with the money they pay him, and furnishes them with food in the same way. In most cases wooden benches, with shelves above, are erected around the room, and each man has six feet of bench or shelf-room to himself. Bedclothes are not necessary, as every man sleeps in his clothes, which he changes only after he has been to his bath. In the middle of the room is a table surrounded by forms, and on it the crew eat their food with wooden spoons from a large iron crock or clumsy wooden bowls. Cabbage soup, boiled buckwheat or millet, with plenty of black bread and salt, is the principal food eaten by the workmen. These 'artels' would be very good were it not that in every instance the rooms are too small, and are overcrowded to a degree which would shock people well acquainted with the fever dens of Seven Dials. In winter the warmth from the stove, with no ventilation whatever, makes the rooms suffocatingly hot; the filthy floors and benches, washed only twice a year, the dirty clothing, the greasy sheep-skins, and the toil-stained 'moujiks,' emit an odor so strong that nobody but the workmen themselves can stand it. In these hovels, where the men herd like pigs—I know one large house that contains 400 men, and is from top to bottom one vast pig-stye—in these places, when the regular autumnal cholera sets in, the workmen die by scores. Drunkenness is rife among the workmen because it is the only amusement they possess. Without home, without relations, with no rational recreations provided them by their masters, without any education to assist them in finding any, they have no other means of enjoying themselves except by resorting to the dram shop. An inveterate drunkard is in England the exception, in Russia it is the sober man who occupies that place. A total abstainer is so great a rarity that when one is seen he is regarded as a wonder, who is rather to be contemptuously pitied than approved. And whereas an English workman drinks gin by the gill, diluted mostly with water, the Russian drinks it by the pint, and never adds a drop of water to it. A few Sundays ago I was passing along the quay of Baird's Iron Works, where some laborers were breaking up an old barge. The gauger brought a two-gallon bottle of vodsky, and every man of those thirty-seven laborers drank off a tumbler full of raw vodsky as though it had been water. The bottle was then put aside for another dram later in the afternoon. In Tamboff I have seen women perform the same trick, and not long ago a *dvornick* having made a bet to drink a gallon of vodsky, drank three pints before he fell down dead."

Rain Water.

So bountifully are we supplied with the beneficent rain, that in England and Wales it is calculated we make use only of a seventy-fourth part of the actual rain fall. The area of England and Wales we may take as comprising thirty-seven millions of acres, and as there falls about thirty-two inches of rain during each year upon an average, and each inch of rain falling upon an acre of ground supplies 22,622 gallons, it will be seen that that portion of the kingdom is yearly supplied by over 27,000,000 gallons of water in the shape of rain, not including dew fall, which is very abundant. The twenty-five millions of population in England and Wales should each use, if they had the opportunity, twenty-five gallons per diem, which would be 625 millions of gallons daily, or nearly 229,000 millions per annum. The lower animals may be taken as fifty millions, and as consuming in stable, shippen and kennel about five gallons each daily, or 250 millions of gallons per diem, which would be at the rate of 91,000 millions of gallons in each year. Engines and other contrivances will probably absorb about 125 millions of gallons more during each day, or about 45,000 millions during the year. The quantity of water actually used in England and Wales by man and beast may be taken as about 365,000 millions, which is, as before stated, only a seventy-fourth part of our total rain fall.

It is, therefore, evident that where rivers and lakes are absent, and springs cannot be found or wells sunk, recourse should be had to the collection of rain water. A tank should, therefore, be provided for each cottage in such situations, and, as Mr. Denton has calculated that an ordinary cottage roof will cover two and a half poles, this will be sufficient to collect some 7000 gallons, taking the rain fall at twenty inches only. In a similar way a large farm house and out-buildings, covering ten poles, will collect over 28,000 gallons yearly. Tanks for collection can be constructed at a reasonable expense. The inhabitants of a moderate sized village might combine, and, at a cost of twenty-five shillings only, properly supply themselves with sufficient water, or they might borrow money at five per cent. for the construction of the reservoir, pipe, &c., and spread over forty years; the cost to each village need not reach eighteen pence per annum. All obstructions in the way of land owners farming out such water to the neighboring hamleteers should moreover be removed.

It is not only the water which falls upon the roofs, and which could be collected in a comparatively clean state, which is worth storing under certain circumstances, but the water which falls on the paths and paved yards in and around some houses may likewise be collected and made extremely useful in the garden. Nor is this all. On clay land farms the under-drainage water can be gathered in ponds or underground tanks, for the use of the cattle. A field tank, to hold 2500 gallons, need not cost more than £16, and would be sufficient for a small holding of 20 acres, and supply a 10 horse-power engine as well as the cattle. As to the method of constructing these tanks, much will depend upon the site; it can be built of brickwork in cement, or of concrete rendered over inside with cement. Cases may occur when brickwork in mortar will suffice, and a sufficiently water proof backing got with clay puddle behind. The thing which requires most care is to see that the walls of the tank are sufficiently strong to resist hydrostatic pressure.

It is very evident that the bulk of the people of the country are lamentably ignorant of the means how to increase their store of water, and whoever first mooted the idea that a royal commission should be appointed to examine and report upon the state of villages and towns where a paucity of water exists did the community a service. The commission should be empowered to make experiments as to the best form of tanks, and the materials best suited for the various districts. Thousands of persons would construct these tanks were they only cognisant of the cost and the procedure. The commission should be composed of physician, chemist, lawyer and engineer, one or more of each profession. The report of such a commission would prove a most valuable contribution to the sanitary literature of the country.—*Sanitary Record.*

Iron Gun Carriages.—A new gun carriage is being tried by the military authorities in France. It is for field artillery, is made of iron bolted together, and is one-half lighter than the wooden carriages now in use. The wheels are set rather wider apart than usual, so as to allow of two seats for gunners being fixed on the axle. The double powder caisson has also been modified, the new one holding more ammunition, but only having two seats, so as to reduce the weight.

Immense Coal Deposit.—A new coal bank has been discovered in Montgomery county, Kentucky, that is said to be the largest in the world. The vein measures 13 feet in thickness at one point and 12 feet at another. It is situated on the Poland Fork of Indian Creek, about 18 miles from Mount Sterling. The coal is of a very superior quality, of the splint variety, and entirely free from sulphur. It burns up clean, and leaves a beautiful white ash and no cinder.

Large Discovery of Ancient Coins.

The Paris correspondent of the London *Times* writes: "An interesting discovery has just been made at the watering place of Bourbonne-les-Bains, in the Department of the Haute-Marne. In clearing the reservoir of the thermal waters, over four thousand bronze coins or medals and a few gold coins have been extracted from the mire. The gold coins have the diameter of an English florin, and bear the effigies of Nero, Honorius, Hadrian and Faustina Senor. Those which are marked with the effigy of Honorius have on one side a head crowned with laurel, and the words—here are the exact word in Roman lettering—'dnhonori vspfavg,' and on the other side a warrior leaning on a trident and placing his left foot on a vanquished enemy with the following inscription: 'Victori. Mavgvc. Honor.' On the coins bearing the effigy of Faustina is on one side a woman's head with the words 'Favstina, Avg. Fil.,' and other letters which cannot be read, and on the other side a bird on a tree with the word 'Concordia.' These different coins are supposed to have been placed there as *ex voto* offerings presented by the sick who wished to propitiate the Divinity or to thank it for success obtained from the thermal treatment which they had been undergoing. Beside these medals a considerable number of bronze pins and rings were found. One of the rigs represents the fore feet of a horse, others the head of a dragon or serpent; also several small bronze statues representing warriors and wrestlers. These statuettes are exquisitely worked and admirably modeled. There are, finally, several stone pillars bearing inscriptions. The following inscription on one of these last is not without interest. Here is this inscription, or what can be read of it: '*Borvoni et Damonæ Exti Fil Æd.*' Borvo, whence Bourbonne derived its name, was one of the numerous names of Apollo. It is supposed also that Sextus, father of Sextilla, was Sextus Empiricus, the famous medical man who lived about the year 140 under the reign of Antoninus Pius, the adopted son and successor of Hadrian."

The Kentucky Rolling Mill, at Louisville, has had a very interesting history. Built a few years since, with but eight puddling furnaces, one heating furnace, and a twelve-inch bar mill, giving a capacity of about 1750 tons per annum, it has to-day twelve puddling furnaces, two scrap furnaces, three heating furnaces, one bar mill, and one small mill, with a capacity of about 5000 tons per annum—nearly treble its starting capacity. It has also been greatly improved by the addition of machinery adapted to the manufacture of light T and tram rails, for which it has an extensive reputation and a constantly increasing trade. In conclusion we would give the following record of its work: On a twelve-inch mill they have rolled as high as 33 lb. tram and 40 lb. T rail; they have rolled 2⅛ inch round iron as long as 35 feet, and have worked a pile 565 pounds in weight. One week's work on this mill alone has amounted to 114 tons. The proprietors would be glad to hear of any mill of the size that can show a better record.

Steam Mantle for Steam Cylinders.

In a meeting of engine builders at Manchester, in 1873, Hildebrandt stated that by the use of a cylinder mantle the work of the engine was slightly increased; that it kept the steam dry during the piston stroke, and prevented the accidents which might be occasioned by condensed water in the cylinder. On the other hand, there is a positive loss of fuel, an increase of labor in consequence of the amount of attention and watching, and an additional outlay of 20 per cent. of capital is involved in its use. Hence cylinder mantles are not economical, but worthless.

Prof. Thoma refers to this in an article which appeared recently in the Bavarian *Industrie und Gewerbeblatt*. He remarks that he does not understand how condensed water in cylinders, which have an escape for the steam at the lowest portion, like a Corliss engine, can cause an accident, nor is it clear how there can be a loss of time on the part of the attendant. The 20 per cent. also appears to him too high.

In judging whether the mantle enables the same amount of fuel to do more work or not, the following experiments made by Bissinger, an engineer in Augsburg, are of value. The experiments were made with an upright engine of 30 horse-power. The steam pipe leading from the boiler to the engine was 216½ feet long; 52½ feet of this was 3·45 inches in diameter, the remainder 6 inches. The boiler had two main heaters, and three for previously heating, with a heating surface of 825 square feet. The water condensed in the steam pipe was conducted to the boiler partially in the boiler house and partially from the water collector. The water condensed in the steam mantle was led away by a self-acting condensing arrangement.

In the experiments with the steam jacket, or mantle, the steam was introduced into the steam mantle underneath the steam cylinder; in experiments without the mantle the steam was introduced above the cylinder, after the mantle was unfastened above and below. The steam cylinder was surrounded by a felt composition and a wooden case.

During the experiment the engine was connected with a turbine, and the velocity of the engine was regulated by this turbine, because the governor was disconnected and the throttle valve set so as to preserve a constant head of steam. The waste space at the dead center was 3 per cent. of the interior of the cylinder, the diameter of the cylinder was 36·67 c. m. (14½ inches); that of the piston rod, not prolonged backward, 5·5 c. m. (2·17 inches); the stroke was 59 c. m. (nearly 2 feet). The average results of the experiments were as follows:

Steam pressure in boiler (spring manometer) atmospheres.	5·35	6·32	7·20	5·34	6·87	7·34	5·298	6·324	7·327
Steam pressure in boiler controlling manometer, atmospheres	5·13	6·07	7·05	5·04	6·12	7·09	5·048	6·081	7·049
Vacuum in centimeters	67·5	67·0	66·8	65·5	65·	64·5	64·5	65·	64·5
Initial tension of steam in cylinder	4·90	5·70	6·84	4·9	5·97	6·79	4·6	5·38	6·46
Revolutions per minute	62·34	63·12	63·37	63·	63·	63·16	63·16	63·75	63·17
Average pressure on piston, atmospheres	1·837	2·116	2·454	2·00	2·306	2·68	1·813	2·152	2·459
Work in indicator, horse-power	32·30	37·77	43·93	35·64	42·08	47·87	32·39	38·79	43·04
Quantity of water per day in zoll pounds	6,850	9,555	9,181	11,170	12,535	13,000	11,397	13,440	14,840
Percentage of feed water condensed in the steam pipe	15·8	14·7	14·8	11·4	10·6	10·5	11·8	10·9	11·3
Percentage of feed water condensed in mantle	8·2	8·1	8·1	7·6	6·6	6·5	....	....	....
Hourly consumption of water or steam per indicated horse-power, after deducting all condensed water	19·65	18·23	16·52	21·67	20·80	20·31	....	....	....
Hourly consumption of steam per horse-power after deducting water condensed in steam pipe	21·79	20·14	18·26	23·72	22·34	21·90	26·6	26·47	25·56

From this table it will be seen that the consumption of water, with partially open valve (higher expansion), for the same amount of work, is less than with a larger supply of steam. That with a constant head of steam the consumption of water decreases with the increase of pressure, and that with equal heads of steam on and equal pressure of steam, the quantity of water consumed hourly per horse-power with the steam mantle is on an average 3·49 lbs. less than in a cylinder without a steam mantle or jacket.

A practical engineer who has used the jacket tells us he would not use one indoors, but for streets and field work in cold weather it is useful and profitable.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Feb. 24, 1875.

The past week has been comparatively uneventful, and as is usual with weeks interrupted by the occurrence of legal holidays, the transactions have not been large or important. The money market continues very easy, with rates on call 2 @ 3 per cent., and discounts on prime business paper 4 @ 6 per cent.

The bank statement shows a loss in the total reserve of $5,494,700, which includes $3,240,100 in specie. The following is a comparison of the averages for the past two weeks:

	Feb. 13.	Feb. 20.	Differences.
Loans	$293,111,300	$294,850,100	Inc. $1,738,900
Specie	15,894,300	12,154,200	Dec. 3,240,100
Leg. Ten.	56,647,400	54,392,800	Dec. 2,254,600
Deposits	238,832,300	236,223,800	Dec. 2,608,500
Circ'lation.	23,512,900	22,584,400	Dec. 928,500

The gold market has been somewhat disturbed by speculative operations. In the early part of the week cash gold was locked up by a clique, and borrowers were accommodated at one-sixteenth of 1 per cent. per day. The following shows the range of the premium:

	Highest.	Lowest.
Thursday	115⅛	114⅞
Friday	115⅞	114⅝
Saturday	114⅝	114⅜
Monday	..	..
Tuesday	114⅝	114⅜
Wednesday	114⅝	114⅜

The Stock market has been feverish and irregular. On Tuesday prices began to decline, led by Pacific Mail, which weakened when it was understood that Congress would not continue the subsidy. The principal dealings have been in Pacific Mail, Western Union, Lake Shore and Mississippi, Northwest and Wabash. The highest and lowest of to-day's prices of active shares are given below.

Government bonds have moved in close sympathy in gold. Railway mortgages have been strong, especially Union Pacific. We give below the closing prices of Governments.

The following tables show the foreign trade movements for this week:

IMPORTS.

	1873.	1874.	1875.
Total for week	$9,983,515	$9,623,667	$7,974,703
Prev. reported	53,692,477	42,446,942	38,376,560
Since Jan. 1	$63,675,992	$52,070,669	$46,351,263

Included in the imports of general merchandise are articles valued as follows:

	Quant.	Value.
Anvils	100	$1,000
Brass goods	22	2,205
Bismuth	2	701
Bronzes	3	1,012
Chains and anchors	207	8,510
Cutlery	125	36,482
Gas fixtures	1	810
Guns	40	4,105
Hardware	61	5,306
Iron, pig, tons	200	4,475
Iron, sheet, tons	2	780
Iron cotton ties	450	1,305
Iron, other, tons	67	5,181
Iron ore	310	461
Lead, pigs	2,023	13,469
Metal goods	183	28,718
Nails	36	1,114
Needles	16	6,422
Old metal		1,312
Plated ware	2	242
Saddlery	5	2,065
Steel	1,237	17,467
Silverware	3	118
Tin, boxes	81,903	256,698
Tin (1,535 slabs)	78,778	17,107
Wire	419	7,015
Zinc	11,050	762

EXPORTS, EXCLUSIVE OF SPECIE.

	1873.	1874.	1875.
Dry Goods	$5,281,755	$3,457,866	$3,658,659
General Mds.	4,701,760	6,165,801	4,316,044
For the week	$9,983,515	$9,623,661	$7,974,703
Prev. reported	53,692,477	42,446,942	38,376,560
Since Jan. 1	$63,675,992	$52,070,609	$46,351,263

EXPORTS OF SPECIE.

Total for the week	$511,839
Previously reported	11,653,332
Total since January 1, 1875	$12,165,171
Same time in 1874	4,791,835
Same time in 1873	9,706,167

Government bonds closed at the following rates:

	Bid.	Asked.
U. S. Currency 6's	119	119¼
U. S. 6s 1881, reg.	118¾	119
U. S. 6s. 1881, cou.	119¼	120
U. S. 1862, 5-20 reg	116⅜	116½
U. S. 5-20 1862, cou.	116⅜	116¼
U. S. 5-20 1864, reg.	117⅛	117⅜
U. S. 5-20 1864, cou.	117⅛	117⅜
U. S. 5-20 1865, reg.	118½	119
U. S. 5-20 1865, cou.	119⅛	119¼
U. S. 5-20 1865, reg. new	118¼	118¾
U. S. 5-20 1865, cou.	118½	118¾
U. S. 5-20 1867, reg.	119	119¼
U. S. 5-20 1867, cou.	119¼	119½
U. S. 5-20 1868, reg.	119	119½
U. S. 5-20 1868, cou.	119⅜	119½
U. S. 10-40 reg	113⅝	114
U. S. 10-40 cou.	116⅛	117⅛
U. S. 5s, 1881, reg.	114¾	115
U. S. 5s, 1881, cou.	114¼	115

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	101⅜	101¼
Lake Shore	73⅜	73¼
Rock Island	103¾	103¾
Del., Lack. and Western	110	110
Michigan Central	73	73
Illinois Central	101¼	101
Wabash	11⅞	10½
Canton Land Co.	63	62
Western Union Telegraph	73¼	72½
Atlantic and Pacific Telegraph	23	24
Northwestern	42¾	42¾
" Pref.	55¼	54¾
Milwaukee & St. Paul	34½	32½
" Pref.	54¼	54¼
Panama	113	112
Pacific Mail	33¼	31
Erie	27¼	27¼
Ohio & Mississippi	25¾	24¾
Union Pacific	40¼	39¾
C., C. & Ind. Central	6¼	6
Missouri Pacific	45¾	45¼
Quicksilver	24¾	24¾
American Merchants' Union Express	63½	63½
United States Express	58¼	58¼

GENERAL HARDWARE.

With some exceptions, business is fairly active, although trade has been greatly retarded by the inclemency of the winter. It is to be hoped that the milder weather of the past three or four days will soon remedy this difficulty. Numerous letters orders are being received and travelers are generally doing as well as could be expected. There is still a great deal of difficulty in handling heavy goods.

In English and German goods there seems to be no change whatever to report, either on this side or the other. Business is reported fair, but by no means brisk.

Nails continue without change, and we repeat our quotation of $3·40 for small lots, and $3·35 for lots of 200 kegs or over.

Russell & Erwin Mfg. Co. are now issuing the discount sheet to Volume 3 of their catalogue, the publication of which we noticed last week. This is the first discount sheet of goods not made by them that they have issued in a long time. We give below that part relating to the manufactures of the Douglass Mfg. Co., as Augers and Bits have been selling at irregular prices for some time, and this is the only recent printed quotation to establish the selling prices:

Carpenters' Sticks	dis. 60&10 %
Socket Framing Chisels, Extra	60. 10&10 %
" " " No. 1	70 %
" " " Farmers'	60, 10&10 %
" " " Millwright's	60&10 %
" Corner Chisels	60&10 %
" Firmer " Extra	60&10 %
" " " 5⅝ in., No. 1	60, 10&10 %
" " " 4⅝ in., No. 1	70 %
" " " Millwrights'	25&10 %
" " " Paring	25&10 %
" " " Coachmakers'	25&10 %
" " Gouges	25&10 %
" " " Millwrights'	25&10 %
" " " Paring	25&10 %
Tanged Firmer Chisels, Extra	40 %
" " " No. 1	40&10 %
" " " Paring	40 %
" " " Coachmakers'	40 %
" " " Millwrights'	40 %
" " Gouges, Extra	40 %
" " " No. 1	40&10 %
" " " Paring	40 %
" " " Millwrights'	40 %
Turning Chisels	40 %
" Gouges	40 %
Drawing Knives, Extra	60, 10&10 %
" No. 1	70 %
" Farmers'	60, 10&10 %
" Shingle	60&10 %
" Carriage Makers'	60&10 %
" Wagon Makers'	60&10 %
Screwdrivers, Sewing Machine	25&10 %
" Extra R. W. Handles	25&10 %
" Extra	25&10 %
" No. 1	20&10 %
" Undertakers'	20&10 %
Cook's Carpenters' Augers	40, 10&10 %
" Millwright Augers	40, 10&10 %
" Boring Machine Augers	40, 10&10 %
" Ring Augers	40, 10&10 %
" Plug Bits	40, 10&10 %
" Cast Steel Bits	40, 10&10 %
" Cast Steel Car Bits, 12 inch	40, 10&10 %
" " " 9 inch	45, 10&10 %
" Handled Auger Bit	40, 10&10 %
" Dowel and Sugar Bits	40, 10&10 %
Millwrights' Augers	40 %
Cast Steel Extra Augers	40&10 %
" No. 1 Augers	40, 10&5 %
" Post Augers	40 %
Gas Fitters' Augers	40 %
Short Eye Augers, Black Lip	40 %
Long " "	40 %
" " Black	40 %
" " Cuban	40 %
Rafting Augers	40 %
Boring Machine Augers	40&10 %
Long Bright Augers	40 %
Short Bright Augers	40 %
Cast Steel Bits, Extra	40&10 %
" " No. 1	40, 10&5 %
" Car Bits	20 %
" Machine Bits	
Cook's Machine Bits	
3, 4 and 6 in	20&10 %
9 and 12 in	20 %
New Pattern Hollow Augers	40 %
Old Pattern Hollow Augers	40 %
Ames' Patent Hollow Augers	40 %
Plug Cutters	10 %
Universal Hollow Augers	10 %
Spoke Trimmers	20&10 %
Tap Borers	20&10 %
Ring Tap Borers	20&10 %
Boring Machines—	
No. 5, no Augers	$3·25 net.
No. 5, 18 qrs "	5·00 net.
No. 2, no "	4·00 net.
No. 2, 18 qrs "	6·00 net.
Others	40 %
Boring Machine Augers, C. S.	40&10 %
" " Cook's	40, 10&10 %
" " Parts	10 %
Gimlets	20&10 %
Cast Steel Spike Gimlets	20&10 %
Double Cut "	20&10 %
" Bits	20&10 %
Hammered Twist Gimlets	20&10 %
" Bits	20&10 %
Gimlet Bits	20&10 %
Blake's Expansive Bits	40 %
Reamers	10 %
Countersinks	10 %
Screwdriver Bits	10 %
Douglass Patent Auger Handles	10 %
Swan's " "	20&10 %
Nail Sets	20 %

Russell & Erwin Mfg. Co. have for sale a new line of Cast Steel Hammers, Adze Eye and Adze Eye Bell Face, which they offer at 10 per cent. discount from Maydole's list. These goods are beautifully finished, and warranted entirely first class.

On this page we give the new list of the Union Emery Wheels, which is, we are informed, a reduction of from 25 to 50 per cent. from previous list. This company has just opened stores in New York and Philadelphia. We extract as follows from their circular:

The Union Stone Company, believing the high price of Solid Emery Wheels to be the great drawback to their general adoption in the place of Files and Grindstones, have directed their efforts to reduce the price, and have succeeded within the last few months, by the addition of new and patented machinery, in greatly reducing the cost of production, and in bringing the manufacture of the Union Emery Wheel to a system, thereby securing a uniformity in quality and hardness hitherto unequalled.

The Union Stone Company have been the pioneers in many improvements connected with the Emery Wheel trade, and are now the first to offer this reduction in price to the public, and herewith present a price list so reasonable as to enable every one who needs an Emery Wheel to buy it.

The Union Emery Wheel has stood for years second to none in quality, and the recent improvements make it far superior to all. It is warranted to contain a greater percentage of the best Emery than any other solid Emery Wheel, to cut fast and free, without glazing, and at the same time to be durable.

The New York Lace Leather Works, in a circular dated the 1st instant, say:

We have on hand this season a large assortment of Marshall's raw hide; also, Patent Lace Leather, at prices much lower than past season. We offer extra first selection, large and heavy, $33·00 per dozen; No. 1, $27·00, per dozen; No. 2, $24·00 per dozen; No. 3, $18·00 to $21·00 per dozen. Cut lace and by the bale as low as any other manufacturer. No charge for packing or cartage.

Tatham & Brothers issue, under date of the 19th instant, the following new price list of their goods, showing an advance in almost all:

Buck Shot	11c.
Drop "	10c.
Shot in 5 lb. bags	1c. in advance
Bar Lead	8½c.
Lead Pipe	9c.
Sheet Lead	9½c.
Block Tin Pipe	45c.
Tin Lined Pipe	16½c.

No cartage on Shot in lots of 1000 lbs. We allow for old Lead, in trade, 6½c. per lb. Full net price allowed for all reels and packages returned to us in good order.

TERMS TO DEALERS.—A discount of 10 per cent. will be made from above prices for settlement within 30 days from date of purchase. If accounts are not paid by that date, the discount will be reduced at the rate of 1½ per cent. per month. An extra discount of ½ per cent. will be allowed for cash on receipt of invoice.

Among our special notices will be found an advertisement of the sale at auction next Wednesday of the entire stock in New York of Woolworth Handles, amounting to 5000 dozen. The sale of these standard goods is worthy of the attention of the trade.

James Ostrander & Son, Troy Fire Brick Works, issue the following under date of the 16th inst: We have to announce that we have received another visitation from fire, which occurred this morning by the hands of an incendiary, and has resulted in the destruction of our works, except the kilns and storehouses. Notwithstanding our severe losses, we intend to continue business as usual, and as our stock of Fire Brick of all kinds is quite ample to meet the demand until we can resume manufacturing again, any orders you may send us will be filled with our usual promptness.

We have received the following circular:

Established in New York in 1833. *Established in Chicago in* 1847.

COPARTNERSHIP NOTICE.

CHICAGO, Feb. 15, 1875.

To our Friends and Patrons: The partnership heretofore existing under the firm name of "Edwin Hunt & Sons," having been dissolved by the death of the Senior member, Edwin Hunt, we take this opportunity of announcing that we have formed a new partnership, and will hereafter carry on the Hardware business under the firm name and style of Edwin Hunt's Sons.

We have purchased the entire interest of the late Edwin Hunt in the old firm, and will collect all debts due said firm, and pay all its liabilities.

We trust that the patronage and good will which were so generously extended to the old firm will be continued to the new. We will continue to fill all orders with our usual promptness and despatch, and, we hope, to the entire satisfaction of our customers. Soliciting your orders, we remain,

Yours, respectfully,
EDWIN HUNT'S SONS,
Successor to EDWIN HUNT & SONS,
58 & 60 Lake street.

A. LUCAS HUNT, }
WILLIAM F. HUNT, } General Partners.

We invite the attention of the trade to the advertisement on 24th page of John D. Shepard, Buffalo, N. Y. in which he illustrates "Shepard's Two Way Gate Hinge and Latch," which possesses both merit and novelty. The Latch, which is entirely new to the trade, is attached without either mortising or cutting the gate or fence posts. The Hinges are very strong, and the whole is symmetrical. In the past, when it was desired to hang gates to swing in and out (a method which possesses, in a majority of cases, decided advantages over the ordinary way), it was found necessary to use Wrought Hinges and Latches in order to obtain the required strength and durability, and the increased cost on this account has prevented, to a great extent, their general use. The manufacturer claims that this "Two Way Hinge and Latch," although offered to the trade at a great reduction from the cost of wrought goods, is equally durable. The list price for the Hinges and Latches complete is $9 per dozen; for the Latches only, $2·50 per dozen, with a discount to the trade. Mr. Shepard is also manufacturing a new pattern Surface Reversible Gate Hinge and Latch, and his well known patterns of Double Locking and Standard Blind Hinges.

Howard & Morse, of the National Wire and Lantern Works, have issued the following sheet of net cash discounts to the trade:

Screen Wire Cloth	(by the roll) dis. 45 %
Square Wire Smut Cloth	" " 45 %
Crimped Locomotive Spark Wire Cloth	" " 45 %
Twilled Locomotive Spark Wire Cloth	" " 45 %
Different Grades of Iron Wire Cloth, from No. 2 to No. 24 Mesh, inclusive	(by the roll) dis 45 %
Different Grades of Iron Wire Cloth, from No. 30 to No. 80 Mesh	" " 25 %
Tinned or Plated Iron Wire Cloth	" " 35 %
Painted Window Screens Wire Cloth	" " 35 %

BRASS WIRE CLOTH.

On all Grades and Meshes from No. 2 to No. 10 Mesh, inclusive.	
To Consumers	dis. 25&5 %
To Commission or Hardware Trade	30&5 %
To Wire Workers	35&5 %
On all Grades and Meshes from No. 12 to No. 100 Mesh, inclusive.	
To Consumers	dis. 15&5 %
To Commission or Hardware Trade	20&5 %
To Wire Workers	25&5 %
Brass Milk Strainer Wire Cloth, to all Parties	10 %

Galvanized Twisted Wire Netting, by the bale	dis. 40 %
Galvanized Twisted Wire Fencing, by the bale	30 %
Rat and Mouse Traps	10 %
Nursery Fenders and Spark Guards	15 %
Steak and Oyster Broilers	10 %
Meat or Provision Safes	10 %
Riddles, Coal and Sand Screens	15 %
Clock Work Fly Traps, by the case	25 %
Round, Oval and Oblong Dish Covers	25 %
Wire Rope for Dumbwaiters, &c	35 %
" for Hoisting and Rigging	5 %
Wire Picture and Sash Cord, by the spool	50 %
Window Screens made to order	15 %
Plain and Ornamental Wire Work	20 %
Wash Stands and Towel Racks	20 %
Bank, Counter and Office Railing	20 %
Wire Fence, Guards, Doors and Cemetery	20 %
Wrought Iron Hurdles and Fence	20 %
" Hay Racks	20 %
" Stall Partitions	20 %
Cast Iron Stable Fixtures	15 %
" Crestings and Finials	10 %
Ship, Hand and Railway Lanterns	25 %
" " " Glass	10 %
All Extras	5 %

We make the following extract from their price list:

PRICE LIST OF IRON WIRE CLOTH.

The Mesh in Wire Cloth is the distance from the center to the center of the Wire. No length less than 100 feet shall be understood to be a Roll.

Hardware Grade, Iron Wire Cloth.

	Per Square Foot.
No. 2 Mesh, made from No. 18 Wire	$0·10
No. 3 " " 19 "	10
No. 3½ " " 20 "	10
No. 4 " " 21 "	10
No. 5 " " 22 "	10
No. 6 " " 23 "	10
No. 8 " " 25 "	10
No. 10 " " 27 "	10
No. 12 " " 29 "	10
No. 14 " " 31 "	10
No. 16 " " 32 "	10
No. 18 " " 33 "	10
No. 20 " " 34 "	12
No. 24 " " 35 "	15
No. 30 " " 36 "	19

Riddle Grade, Iron Wire Cloth.

	Per square foot.
No. 2 Mesh, made from No. 16 Wire	$0·15
No. 3 " " 17 "	15
No. 3½ " " 18 "	15
No. 4 " " 19 "	15
No. 5 " " 20 "	15
No. 6 " " 21 "	15
No. 7 " " 22 "	15
No. 8 " " 23 "	15
No. 10 " " 25 "	15
No. 12 " " 26 "	15

Stout Rice Wire Cloth

	Per square foot.
No. 8 Mesh, made from No. 20 Wire	$0·30
No. 10 " " 21 "	30
No. 12 " " 22 "	30
No. 14 " " 23 "	30
No. 16 " " 24 "	30

Heavy Iron Wire Bolting Cloth.

	Per square foot.
No. 30 Mesh, made from No. 30 Wire (Blued)	$0·45
No. 40 " " 33 "	50
No. 50 " " 35 "	60
No. 60 " " 36 "	70
No. 64 " " 37 "	75
No. 70 " " 38 "	80
No. 74 " " 39 "	90
No. 80 " " 40 "	1·05

This grade of cloth is wove and kept in stock 18 inches wide.

The increasing demand for Iron Wire Bolting Cloth has induced us to turn our attention more particularly to this branch of the business. The universal complaint and difficulty which every manufacturer has to contend with, is its liability to rust; this we have overcome most effectually by coating it with a preparation (known only to ourselves) in such a manner that no rust can touch it. Aside from this advantage, we feel confident in saying we can and do produce an article superior to any ever manufactured in this country. It is made of a larger wire, and driven up square, which, on an average, makes it equal to ten meshes finer per square inch.

Tinned Wire Cloth.

	Per square foot.
No. 16 Mesh Cloth	$0·13
No. 18 "	14
No. 20 "	16
No. 24 "	20
No. 30 "	30
No. 40 "	45

Wire Window Screen Cloth.

	Per square foot.
Plain Green or Drab, by the Roll	$0 ·8
Landscape, by the Roll, 1st quality	40
" " 2d quality	30

Regular Market Grade of Brass Wire Cloth.

	Per square foot.
No. 2 Mesh from No. 16 Wire	$0·50
No. 3 " " 17 "	50
No. 4 " " 18 "	50
No. 5 " " 19 "	50
No. 6 " " 20 "	50
No. 8 " " 22 "	50
No. 10 " " 23 "	50
No. 12 " " 24 "	50
No. 14 " " 25 "	50
No. 16 " " 26 "	50
No. 18 " " 27 "	50
No. 20 " " 28 "	50
No. 22 " " 29 "	50
No. 24 " " 30 "	50
No. 30 " " 31 "	52
No. 40 " " 33 "	55
No. 50 " " 35 "	58
No. 60 " " 36 "	60
No 70 " " 37 "	70
No. 80 " " 38 "	90
No. 90 " " 39 "	1·00
No. 100 " " 40 "	1·15

Brass Milk Strainer Wire Cloth.

	Per sq. ft.
By the quantity	$0·20
Less than 1000 feet at an order	22

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, Feb. 24, 1875.

Scotch Pig.—The market is active, and a large business has been done. Prices are advancing. The following are makers' quotations:

Gartsherrie, No. 1	89/
Coltness, No. 1	92/
Glengarnock, No. 1	86/
Eglinton, No. 1	76/6

Manufactured Iron.—No change to note in condition of the market, and quotations remain £9. 10/ @ £10. 5/ for Best Staffordshire Bars.

Rails.—Market dull. Welsh are quoted £6. 10/ @ £7. 5/.

IRON.

American Pig—The prospect of coal troubles has made the Iron companies indifferent to making sales, and some of them are holding at $30, but with few, if any, sales. We hear only of some Coleraine. There is, however, Iron in the hands of second parties, which can be bought at from $28 @ $29. Although a determined coal strike would greatly lessen the production of Iron, and considerably advance the price, consumers show no desire to buy in advance of their immediate wants, and business at present amounts to hardly anything. We quote No. 1 Foundry, $28 @ $30; Foundry No. 2, $26 @ $28; Gray Forge, $24 @ $28.

Scotch Pig.—The market is firmer on account of the probable increase of 10 per cent. in the duty. We quote now, Eglinton, $34; and Coltness, $38 @ $39. It is evident that any increased demand would advance the price, especially as our cable reports note an improvement on the other side.

Bar.—The demand is small, but it seems that it is still in excess of production, which is at present very small on account of strikes and severe frost. Stocks everywhere are very much reduced. We quote 2·8 cents for Eastern Mills, and Western, 2·4 @ 2·5 cents.

Rails.—We hear of the sale of 1200 tons of American at $48 at mills. We quote $48 @ $53 at mill.

Old Rails.—There is nothing doing, and we continue our nominal quotation of $27 @ $28.

Scrap.—The stock here is held at $34 @ $35, but we hear of no transactions.

METALS.

Copper.—The market has been steady and quiet, sales for the week having been restricted to 100,000 pounds Lake, on the spot, at 21¾c. Holders are not anxious sellers, and insist on 21⅞c.; we consequently call the market tolerably firm at the close, at 21¾c. @ 21⅞c. Baltimore has, in a small way, brought 22c., but it is not easy to get cash for this figure. As for the general outlook, it is, if anything, reassuring. These first two months of the year have been exceedingly difficult ones, both from a commercial and industrial point of view. The freight movement to and from the far West has, during the present month, been beset with obstacles very nearly insurmountable in many instances; passengers have fared little better, and collections were in many localities absolutely impossible for weeks.

Price List of the Union Emery Wheels, Cancelling all Previous Lists, Stone Center and Solid, Adopted March 1st, 1875.

WHEELS THINNER THAN THOSE NAMED WILL BE CHARGED AT THE NEXT THICKER PRICE IN THE LIST.

THICKNESS IN INCHES.

DIAMETER Inches.	¼	½	¾	1	1¼	1½	1¾	2	2½	3	3½	4	5	6	7	8	9	10	11	12	DIAMETER Inches.	No. of Rev'ns per Min.
1	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	....	....	....	....	....	....	....	....	1	5,000
1½	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	....	....	....	....	....	....	....	....	1½	5,000
2	.20	.25	.30	.35	.40	.50	.60	.70	.80	.90	1.00	1.10	....	....	....	....	....	....	....	....	2	5,000
2½	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	....	....	....	....	....	....	....	....	2½	5,000
3	.45	.60	.75	.90	1.05	1.20	1.30	1.40	1.50	1.60	1.70	1.80	....	....	....	....	....	....	....	....	3	4,800
3½	.60	.75	.90	1.05	1.20	1.35	1.50	1.65	1.95	2.25	2.55	2.85	....	....	....	....	....	....	....	....	3½	4,100
4	.70	.90	1.10	1.25	1.40	1.60	1.75	2.00	2.25	2.50	2.75	3.00	....	....	....	....	....	....	....	....	4	3,600
5	1.15	1.15	1.45	1.75	2.05	2.35	2.65	2.95	3.55	4.15	4.75	5.35	6.55	....	....	....	....	....	....	....	5	3,000
6	1.50	1.50	1.90	2.30	2.70	3.10	3.50	3.90	4.70	5.50	6.30	7.00	8.40	....	....	....	....	....	....	....	6	2,400
6½	1.75	1.75	2.25	2.75	3.25	3.75	4.25	4.75	5.75	6.75	7.75	8.75	10.75	12.75	....	....	....	....	....	....	6½	2,250
7½	2.00	2.00	2.60	3.20	3.80	4.40	5.00	5.60	6.80	8.00	9.20	10.40	12.80	15.20	....	....	....	....	....	....	7½	2,000
8	2.25	2.25	2.95	3.65	4.35	5.05	5.75	6.45	7.85	9.25	10.65	11.05	13.85	16.65	....	....	....	....	....	....	8	1,800
8½	2.50	2.50	3.25	4.00	4.75	5.50	6.25	7.00	8.50	10.00	11.50	13.00	16.00	19.00	22.00	....	....	....	....	....	8½	1,700
9½	....	3.00	3.85	4.70	5.55	6.40	7.25	9.10	10.80	12.50	14.20	15.90	19.30	22.70	26.10	....	....	....	....	....	9½	1,575
10½	....	3.50	4.50	5.50	6.50	7.50	8.50	9.50	11.50	13.50	15.50	17.50	21.50	25.50	29.50	....	....	....	....	....	10½	1,500
12	....	4.00	5.25	6.50	7.75	9.00	10.25	11.50	14.00	16.50	19.00	21.50	26.00	30.00	34.00	38.00	42.00	....	....	....	12	1,200
14	....	....	8.00	8.00	9.50	11.00	12.50	14.00	17.00	20.00	23.00	26.00	32.00	38.00	44.00	50.00	56.00	....	....	....	14	1,050
16	....	....	10.00	10.00	11.75	13.50	15.25	17.00	20.50	24.00	27.50	31.00	38.00	45.00	52.00	59.00	66.00	....	....	....	16	900
18	....	....	....	16.00	16.00	18.00	20.00	22.00	26.00	30.00	34.00	38.00	46.00	54.00	62.00	70.00	78.00	86.00	....	....	18	825
20	....	....	....	20.00	20.50	23.00	25.50	28.00	33.00	38.00	43.00	48.00	58.00	68.00	78.00	88.00	98.00	108.00	....	....	20	750
22	....	....	....	....	....	29.00	32.00	35.00	41.00	47.00	53.00	59.00	71.00	83.00	95.00	107.00	119.00	131.00	....	....	22	675
24	....	....	....	....	....	36.00	39.50	43.00	50.00	57.00	64.00	71.00	83.00	95.00	107.00	119.00	131.00	143.00	155.00	167.00	24	600
26	....	....	....	....	....	44.00	48.00	52.00	60.00	68.00	76.00	84.00	98.00	112.00	126.00	140.00	154.00	168.00	182.00	196.00	26	550
30	....	....	....	....	....	....	....	68.00	75.00	85.00	95.00	105.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	30	500
36	....	....	....	....	....	....	....	100.00	110.00	120.00	130.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	280.00	300.00	36	400
42	....	....	....	....	....	....	....	130.00	140.00	150.00	165.00	180.00	210.00	240.00	260.00	280.00	300.00	320.00	340.00	360.00	42	340
48	....	....	....	....	....	....	....	150.00	160.00	170.00	180.00	195.00	225.00	255.00	285.00	305.00	335.00	385.00	415.00	445.00	48	300

[Entered according to Act of Congress, in the year 1875, by the Union Stone Company, Boston, Mass., in the Office of the Librarian of Congress at Washington.]

Large Discovery of Ancient Coins.

The Paris correspondent of the London *Times* writes: "An interesting discovery has just been made at the watering place of Bourbonne-les-Bains, in the Department of the Haute-Marne. In clearing the reservoir of the thermal waters, over four thousand bronze coins or medals and a few gold coins have been extracted from the mire. The gold coins have the diameter of an English florin, and bear the effigies of Nero, Honorius, Hadrian and Faustina Senor. Those which are marked with the effigy of Honorius have on one side a head crowned with laurel, and the words—here are the exact word in Roman lettering—'dubonori vspfavg,' and on the other side a warrior leaning on a trident and placing his left foot on a vanquished enemy with the following inscription: 'Victori. Mavgvc. Honor.' On the coins bearing the effigy of Faustina is on one side a woman's head with the words 'Favstina, Avg. Fil.,' and other letters which cannot be read, and on the other side a bird on a tree with the word 'Concordia.' These different coins are supposed to have been placed there as *ex voto* offerings presented by the sick who wished to propitiate the Divinity or to thank it for success obtained from the thermal treatment which they had been undergoing. Beside these medals a considerable number of bronze pins and rings were found. One of the rigs represents the fore feet of a horse, others the head of a dragon or serpent; also several small bronze statues representing warriors and wrestlers. These statuettes are exquisitely worked and admirably modeled. There are, finally, several stone pillars bearing inscriptions. The following inscription on one of these last is not without interest. Here is this inscription, or what can be read of it: '*Borvoni et Damonæ Exti Hil Æd.*' Borvo, whence Bourbonne derived its name, was one of the numerous names of Apollo. It is supposed also that Sextus, father of Sextilla, was Sextus Empiricus, the famous medical man who lived about the year 140 under the reign of Antoninus Pius, the adopted son and successor of Hadrian."

The Kentucky Rolling Mill, at Louisville, has had a very interesting history. Built a few years since, with but eight puddling furnaces, one heating furnace, and a twelve-inch bar mill, giving a capacity of about 1750 tons per annum, it has to-day twelve puddling furnaces, two scrap furnaces, three heating furnaces, one bar mill, and one small mill, with a capacity of about 5000 tons per annum—nearly treble its starting capacity. It has also been greatly improved by the addition of machinery adapted to the manufacture of light T and tram rails, for which it has an extensive reputation and a constantly increasing trade. In conclusion we would give the following record of its work: On a twelve-inch mill they have rolled as high as 33 lb. tram and 40 lb. T rail; they have rolled 2⅛ inch round iron as long as 35 feet, and have worked a pile 565 pounds in weight. One week's work on this mill alone has amounted to 114 tons. The proprietors would be glad to hear of any mill of the size that can show a better record.

Steam Mantle for Steam Cylinders.

In a meeting of engine builders at Manchester, in 1873, Hildebrandt stated that by the use of a cylinder mantle the work of the engine was slightly increased; that it kept the steam dry during the piston stroke, and prevented the accidents which might be occasioned by condensed water in the cylinder. On the other hand, there is a positive loss of fuel, an increase of labor in consequence of the amount of attention and watching, and an additional outlay of 20 per cent. of capital is involved in its use. Hence cylinder mantles are not economical, but worthless.

Prof. Thoma refers to this in an article which appeared recently in the Bavarian *Industrie und Gewerbeblatt*. He remarks that he does not understand how condensed water in cylinders, which have an escape for the steam at the lowest portion, like a Corliss engine, can cause an accident, nor is it clear how there can be a loss of time on the part of the attendant. The 20 per cent. also appears to him too high.

In judging whether the mantle enables the same amount of fuel to do more work or not, the following experiments made by Bissinger, an engineer in Augsburg, are of value. The experiments were made with an upright engine of 30 horse-power. The steam pipe leading from the boiler to the engine was 216¼ feet long; 52½ feet of this was 3·45 inches in diameter, the remainder 6 inches. The boiler had two main heaters, and three for previously heating, with a heating surface of 825 square feet. The water condensed in the steam pipe was conducted to the boiler partially in the boiler house and partially from the water collector. The water condensed in the steam mantle was led away by a self-acting condensing arrangement.

In the experiments with the steam jacket, or mantle, the steam was introduced into the steam mantle underneath the steam cylinder; in experiments without the mantle the steam was introduced above the cylinder, after the mantle was unfastened above and below. The steam cylinder was surrounded by a felt composition and a wooden case.

During the experiment the engine was connected with a turbine, and the velocity of the engine was regulated by this turbine, because the governor was disconnected and the throttle valve set so as to preserve a constant head of steam. The waste space at the dead center was 3 per cent. of the interior of the cylinder, the diameter of the cylinder was 36·67 c. m. (14½ inches); that of the piston rod, not prolonged backward, 5·5 c. m. (2·17 inches); the stroke was 59 c. m. (nearly 2 feet). The average results of the experiments were as follows:

Steam pressure in boiler (spring manometer) atmospheres.	5·35	6·32	7·29	5·34	6·37	7·34	5·298	6·334	7·327
Steam pressure in boiler controlling manometer, atmospheres	5·18	6·07	7·05	5·04	6·12	7·09	5·048	6·081	7·049
Vacuum in centimeters	67·5	67·0	66·8	65·5	65·	64·5	64·5	65·	64·5
Initial tension of steam in cylinder	4·90	5·70	6·84	4·9	5·97	6·70	4·6	5·53	6·46
Revolutions per minute	62·34	63·12	63·37	63·	63·	63·16	63·16	63·75	63·17
Average pressure on piston, atmospheres	1·857	2·116	2·454	2·00	2·306	2·68	1·813	2·152	2·459
Work in indicator, horse-power	32·39	37·77	43·98	35·64	41·68	47·87	32·39	38·79	43·94
Quantity of water per day in zoll pounds	8,850	9,355	9,131	11,170	12,553	13,600	11,397	13,440	14,840
Percentage of feed water condensed in the steam pipe	15·8	14·7	14·8	11·4	10·6	10·5	11·8	10·9	11·3
Percentage of feed water condensed in mantle	8·2	8·1	8·1	7·6	6·6	6·5	....	....	....
Hourly consumption of water or steam per Indicated horse-power, after deducting all condensed water	19·63	18·23	16·52	15·67	20·66	20·61	....	....	....
Hourly consumption of steam per horse-power after deducting water condensed in steam pipe	21·79	20·14	18·36	23·72	22·54	21·90	20·61	19·47	25·36

From this table it will be seen that the consumption of water, with partially open valve (higher expansion), for the same amount of work, is less than with a larger supply of steam. That with a constant head of steam the consumption of water decreases with the increase of pressure, and that with equal heads of steam on and equal pressure of steam, the quantity of water consumed hourly per horse-power with the steam mantle is on an average 3·49 lbs. less than in a cylinder without a steam mantle or jacket.

A practical engineer who has used the jacket tells us he would not use one indoors, but for streets and field work in cold weather it is useful and profitable.

Special Notices.

The firm of H. A. ROGERS & CO. (consisting of H. A. ROGERS and W. C. DUYCKINCK) is this day dissolved. The affairs of said firm will be exclusively liquidated and adjusted by W. C. DUYCKINCK, at the old store 50 and 52 John St.

New York, January 18, 1875.

The subscriber will continue to conduct the business of importing, manufacturing and dealing in every variety of Railway, Machinist and Engineers' Supplies at the old store, 50 and 52 John St., New York. New price list now in press.

W. C. DUYCKINCK.

OFFICE OF H. A. ROGERS, 19 JOHN ST., NEW YORK, January 20th, 1875.

The Firm of H. A. ROGERS & CO., 50 and 52 John Street, is this day dissolved by mutual consent, H. A. Rogers retiring.

NEW YORK, January 18, 1875.

In calling your attention to the above notice, I beg to say that I will continue business in my own name and for my own account at No 19 John Street, where may be found a complete stock of Railway, Mill and Machinists' Supplies.

H. A. ROGERS.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Feb. 24, 1875.

The past week has been comparatively uneventful, and as is usual with weeks interrupted by the occurrence of legal holidays, the transactions have not been large or important. The money market continues very easy, with rates on call 2 @ 3 per cent., and discounts on prime business paper 4 @ 6 per cent.

The bank statement shows a loss in the total reserve of $5,494,700, which includes $3,240,100 in specie. The following is a comparison of the averages for the past two weeks:

	Feb. 13.	Feb. 20.	Differences.
Loans	$293,111,200	$294,850,100	Inc. $1,738,900
Specie	15,894,300	12,154,200	Dec. 3,240,100
Leg. Ten.	56,647,4.0	54,392,800	Dec. 2,254,600
Deposits	238,832,300	236,223,800	Dec. 2,608,500
Circ'lation.	23,512,900	22,584,400	Dec. 928,500

The gold market has been somewhat disturbed by speculative operations. In the early part of the week cash gold was locked up by a clique, and borrowers were accommodated at one-sixteenth of 1 per cent. per day. The following shows the range of the premium:

	Highest.	Lowest.
Thursday	115⅛	114⅞
Friday	115⅞	114⅝
Saturday	114⅝	114⅜
Monday	..	..
Tuesday	114⅝	114⅜
Wednesday	114⅝	114⅜

The Stock market has been feverish and irregular. On Tuesday prices began to decline, led by Pacific Mail, which weakened when it was understood that Congress would not continue the subsidy. The principal dealings have been in Pacific Mail, Western Union, Lake Shore and Mississippi, Northwest and Wabash. The highest and lowest of to-day's prices of active shares are given below.

Government bonds have moved in close sympathy in gold. Railway mortgages have been strong, especially Union Pacific. We give below the closing prices of Governments.

The following tables show the foreign trade movements for this week:

IMPORTS.

	1873.	1874.	1875.
Total for week	$9,983,515	$9,623,667	$7,974,703
Prev. reported	53,692,477	42,446,942	38,376,560
Since Jan. 1	$63,675,992	$52,070,609	$46,351,263

Included in the imports of general merchandise are articles valued as follows:

	Quant.	Value.
Anvils	100	$1,000
Brass goods	22	2,205
Bismuth	2	701
Bronzes	3	1,012
Chains and anchors	207	8,510
Cutlery	125	36,482
Gas fixtures	1	810
Guns	40	4,105
Hardware	61	5,306
Iron, pig, tons	200	4,475
Iron, sheet, tons	2	780
Iron cotton ties	450	1,305
Iron, other, tons	67	5,181
Iron ore	310	461
Lead, pigs	2,023	13,469
Metal goods	183	28,718
Nails	36	1,114
Needles	16	6,422
Old metal		1,312
Plated ware	2	242
Saddlery	5	2,065
Steel	1,237	17,467
Silverware	3	118
Tin, boxes	31,903	256,698
Tin (1,535 slabs)	78,778	17,107
Wire	419	7,015
Zinc	11,050	762

EXPORTS, EXCLUSIVE OF SPECIE.

	1873.	1874.	1875.
Dry Goods	$5,281,755	$3,457,866	$3,658,659
General Mds.	4,701,760	6,165,801	4,316,044
For the week	$9,983,515	$9,623,661	$7,974,703
Prev. reported	53,692,477	42,446,942	38,376,560
Since Jan. 1	$63,675,992	$52,070,609	$46,351,263

EXPORTS OF SPECIE.

Total for the week	$511,839
Previously reported	11,653,332
Total since January 1, 1875	$12,165,171
Same time in 1874	4,791,835
Same time in 1873	9,706,167

Government bonds closed at the following rates:

	Bid.	Asked.
U. S. Currency 6's	119	119¼
U. S. 6s 1881, reg.	118⅞	119
U. S. 6s, 1881, con.	119⅜	120
U. S. 1862, 5-20 reg.	116⅜	116⅝
U. S. 5-20 1862, con.	116⅜	116⅝
U. S. 5-20 1864, reg.	117⅛	117⅜
U. S. 5-20 1864, con.	117⅛	117⅜
U. S. 5-20 1864, reg.	117⅛	117⅜
U. S. 5-20 1865, reg.	118⅛	119
U. S. 5-20 1865, con.	119¼	119⅜
U. S. 5-20 1865, reg. new	118⅛	118⅜
U. S. 5-20 1865, con.	118⅛	118¾
U. S. 5-20 1867, reg.	119	119¼
U. S. 5-20 1867, con.	119⅛	119½
U. S. 5-20 1868, reg.	119	119½
U. S. 5-20 1868, con.	119⅛	119⅝
U. S. 10-40 reg.	113⅝	114
U. S. 10-40 con.	116¾	117⅛
U. S. 5s, 1881, reg.	114¾	115
U. S. 5s, 1881, con.	114¾	115

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	101⅝	101¼
Lake Shore	73⅞	73⅛
Rock Island	103⅞	103¾
Del., Lack. and Western	110	110
Michigan Central	73	73
Illinois Central	101¾	101
Wabash	11⅝	10½
Canton Land Co.	63	62
Western Union Telegraph	73¼	73⅛
Atlantic and Pacific Telegraph	25	24
Northwestern	42¾	42¼
" Pref.	55¼	54¾
Milwaukee & St. Paul	34¼	32⅞
" " Pref.	54¾	54¼
Panama	112	112
Pacific Mail	33⅛	31
Erie	27⅞	27¼
Ohio & Mississippi	25¼	24¾
Union Pacific	40⅛	39⅝
C., C. & Ind. Central	6¼	6
Missouri Pacific	45¼	45¼
Quicksilver	34¾	34¾
American Merchants' Union Express	65½	65⅛
United States Express	58¼	58¼

GENERAL HARDWARE.

With some exceptions, business is fairly active, although trade has been greatly retarded by the inclemency of the winter. It is to be hoped that the milder weather of the past three or four days will soon remedy this difficulty. Numerous letters orders are being received and travelers are generally doing as well as could be expected. There is still a great deal of difficulty in handling heavy goods.

In English and German goods there seems to be no change whatever to report, either on this side or the other. Business is reported fair, but by no means brisk.

Nails continue without change, and we repeat our quotation of $3·40 for small lots, and $3·35 for lots of 200 kegs or over.

Russell & Erwin Mfg. Co. are now issuing the discount sheet to Volume 3 of their catalogue, the publication of which we noticed last week. This is the first discount sheet of goods not made by them that they have issued in a long time. We give below that part relating to the manufactures of the Douglass Mfg. Co., as Augers and Bits have been selling at irregular prices for some time, and this is the only recent printed quotation to establish the selling prices:

Carpenters' Slicks	dis. 60&10 %
Socket Framing Chisels, Extra	60. 10&10 %
" " " No. 1	70 %
" " " Farmers'	60, 10&10 %
" " " Millwright's	60&10 %
" Corner Chisels	60&10 %
" Firmer " Extra	60&10 %
" " " 5⅛ in., No. 1	60, 10&10 %
" " " 4⅜ in., No. 1	70 %
" " " Millwrights'	25&10 %
" " " Paring	25&10 %
" " " Coachmakers'	25&10 %
" " Gouges	25&10 %
" " " Millwrights'	25&10 %
" " " Paring	25&10 %
Tanged Firmer Chisels, Extra	40 %
" " " No. 1	40&10 %
" " " Paring	40 %
" " " Coachmakers'	40 %
" " " Millwrights'	40 %
" " Gouges, Extra	40 %
" " " No. 1	40&10 %
" " " Paring	40 %
" " " Millwrights'	40 %
Turning Chisels	40 %
" Gouges	40 %
Drawing Knives, Extra	60, 10&10 %
" No. 1	70 %
" Farmers'	60, 10&10 %
" Shingle	60&10 %
" Carriage Makers'	60&10 %
" Wagon Makers'	60&10 %
Screwdrivers, Sewing Machine	25&10 %
" Extra R. W. Handles	25&10 %
" Extra	25&10 %
" No. 1	20&10 %
" Undertakers'	20&10 %
Cook's Carpenters' Augers	40, 10&10 %
" Millwright Augers	40, 10&10 %
" Boring Machine Augers	40, 10&10 %
" Ring Augers	40, 10&10 %
" Plug Bits	40, 10&10 %
" Cast Steel Bits	40, 10&10 %
" Cast Steel Car Bits, 12 inch	40, 10&10 %
" " " 9 inch	45, 10&10 %
" Handled Auger Bit	40, 10&10 %
" Dowel and Sugar Bits	40, 10&10 %
Millwrights' Augers	40 %
Cast Steel Extra Augers	40&10 %
" No. 1 Augers	40, 10&5 %
" Post Augers	40 %
Gas Fitters' Augers	40 %
Short Eye Augers, Black Lip	40 %
Long " "	40 %
" " Black	40 %
" " Cuban	40 %
Rafting Augers	40 %
Boring Machine Augers	40&10 %
Long Bright Augers	40 %
Short Bright Augers	40 %
Cast Steel Bits, Extra	40&10 %
" " No. 1	40, 10&5 %
" Car Bits	20 %
" Machine Bits	
Cook's Machine Bits, 3, 4 and 6 in	20&10 %
9 and 12 in	20 %
New Pattern Hollow Augers	40 %
Old Pattern Hollow Augers	40 %
Ames' Patent Hollow Augers	40 %
Plug Cutters	10 %
Universal Hollow Augers	10 %
Spoke Trimmers	20&10 %
Tap Borers	20&10 %
Ring Tap Borers	20&10 %
Boring Machines—	
No. 6, no Augers	$3·25 net.
No. 5, 18 qrs "	5·00 net.
No. 2, no "	4·00 net.
No. 2, 18 qrs "	6·00 net.
Others	40 %
Boring Machine Augers, C. S.	40&10 %
" " Cook's	40, 10&10 %
" " Parts	10 %
Gimlets	20&10 %
Cast Steel Spike Gimlets	20&10 %
Double Cut "	20&10 %
" Bits	20&10 %
Hammered Twist Gimlets	20&10 %
" Bits	20&10 %
Gimlet Bits	20&10 %
Blake's Expansive Bits	40 %
Reamers	10 %
Countersinks	10 %
Screwdriver Bits	10 %
Douglass Patent Auger Handles	10 %
Swan's " "	20&10 %
Nail Sets	20 %

Russell & Erwin Mfg. Co. have for sale a new line of Cast Steel Hammers, Adze Eye and Adze Eye Bell Face, which they offer at 10 per cent. discount from Maydole's list. These goods are beautifully finished, and warranted entirely first class.

On this page we give the new list of the Union Emery Wheels, which is, we are informed, a reduction of from 25 to 50 per cent. from previous list. This company has just opened stores in New York and Philadelphia. We extract as follows from their circular:

The Union Stone Company, believing the high price of Solid Emery Wheels to be the great drawback to their general adoption in the place of Files and Grindstones, have directed their efforts to reduce the price, and have succeeded within the last few months, by the addition of new and patented machinery, in greatly reducing the cost of production, and in bringing the manufacture of the Union Emery Wheel to a system, thereby securing a uniformity in quality and hardness hitherto unequalled.

The Union Stone Company have been the pioneers in many improvements connected with the Emery Wheel trade, and are now the first to offer this reduction in price to the public, and herewith present a price list so reasonable as to enable every one who needs an Emery Wheel to buy it.

The Union Emery Wheel has stood for years second to none in quality, and the recent improvements make it far superior to all. It is warranted to contain a greater percentage of the best Emery than any other solid Emery Wheel, to cut fast and free, without glazing, and at the same time to be durable.

The New York Lace Leather Works, in a circular dated the 1st instant, say:

We have on hand this season a large assortment of Marshall's raw hide; also, Patent Lace Leather, at prices much lower than past season. We offer extra first selection, large and heavy, $33·00 per dozen; No. 1, $27·00, per dozen; No. 2, $24·00 per dozen; No. 3, $18·00 to $21·00 per dozen. Cut lace and by the bale as low as any other manufacturer. No charge for packing or cartage.

Tatham & Brothers issue, under date of the 19th instant, the following new price list of their goods, showing an advance in almost all:

Buck Shot	11c.
Drop "	10c.
Shot in 5 lb. bags	1c. in advance
Bar Lead	8½c.
Lead Pipe	9c.
Sheet Lead	9½c.
Block Tin Pipe	45c.
Tin Lined Pipe	16½c.

No cartage on Shot in lots of 1000 lbs. We allow for old Lead, in trade, 6½c. per lb. Full net price allowed for all reels and packages returned to us in good order.

TERMS TO DEALERS.—A discount of 10 per cent. will be made from above prices for settlement within 30 days from date of purchase. If accounts are not paid by that date, the discount will be reduced at the rate of 1½ per cent. per month. An extra discount of ½ per cent. will be allowed for cash on receipt of invoice.

Among our special notices will be found an advertisement of the sale at auction next Wednesday of the entire stock in New York of Woolworth Handles, amounting to 5000 dozen. The sale of these standard goods is worthy of the attention of the trade.

James Ostrander & Son, Troy Fire Brick Works, issue the following under date of the 16th inst: We have to announce that we have received another visitation from fire, which occurred this morning by the hands of an incendiary, and has resulted in the destruction of our works, except the kilns and storehouses. Notwithstanding our severe losses, we intend to continue business as usual, and as our stock of Fire Brick of all kinds is quite ample to meet the demand until we can resume manufacturing again, any orders you may send us will be filled with our usual promptness.

We have received the following circular:

Established in New York in 1833. *Established in Chicago in* 1847.

COPARTNERSHIP NOTICE.

CHICAGO, Feb. 15, 1875.

To our Friends and Patrons: The partnership heretofore existing under the firm name of "Edwin Hunt & Sons," having been dissolved by the death of the Senior member, Edwin Hunt, we take this opportunity of announcing that we have formed a new partnership, and will hereafter carry on the Hardware business under the firm name and style of Edwin Hunt's Sons.

We have purchased the entire interest of the late Edwin Hunt in the old firm, and will collect all debts due said firm, and pay all its liabilities.

We trust that the patronage and good will which were so generously extended to the old firm will be continued to the new. We will continue to fill all orders with our usual promptness and despatch, and, we hope, to the entire satisfaction of our customers. Soliciting your orders, we remain,

Yours, respectfully,
EDWIN HUNT'S SONS,
Successor to EDWIN HUNT & SONS,
58 & 60 Lake street.

A. LUCAS HUNT, WILLIAM F. HUNT, } General Partners.

We invite the attention of the trade to the advertisement on 24th page of John D. Shepard, Buffalo, N. Y. in which he illustrates "Shepard's Two Way Gate Hinge and Latch," which possesses both merit and novelty. The Latch, which is entirely new to the trade, is attached without either mortising or cutting the gate or fence posts. The Hinges are very strong, and the whole is symmetrical. In the past, when it was desired to hang gates to swing in and out (a method which possesses, in a majority of cases, decided advantages over the ordinary way), it was found necessary to use Wrought Hinges and Latches in order to obtain the required strength and durability, and the increased cost on this account has prevented, to a great extent, their general use. The manufacturer claims that this "Two Way Hinge and Latch," although offered to the trade at a great reduction from the cost of wrought goods, is equally durable. The list price for the Hinges and Latches complete is $9 per dozen; for the Latches only, $2·50 per dozen, with a discount to the trade. Mr. Shepard is also manufacturing a new pattern Surface Reversible Gate Hinge and Latch, and his well known patterns of Double Locking and Standard Blind Hinges.

Howard & Morse, of the National Wire and Lantern Works, have issued the following sheet of net cash discounts to the trade:

Screen Wire Cloth (by the roll)	dis. 45 %
Square Wire Smut Cloth " "	45 %
Crimped Locomotive Spark Wire Cloth " "	45 %
Twilled Locomotive Spark Wire Cloth " "	45 %
Different Grades of Iron Wire Cloth, from No. 2 to No. 24 Mesh, inclusive (by the roll)	dis 45 %
Different Grades of Iron Wire Cloth, from No. 30 to No. 80 Mesh " "	25 %
Tinned or Plated Iron Wire Cloth " "	35 %
Painted Window Screens Wire Cloth " "	35 %

BRASS WIRE CLOTH.

On all Grades and Meshes from No. 2 to No. 10 Mesh, inclusive.

To Consumers	dis. 25&5 %
To Commission or Hardware Trade	30&5 %
To Wire Workers	35&5 %

On all Grades and Meshes from No. 12 to No. 100 Mesh, inclusive.

To Consumers	dis. 15&5 %
To Commission or Hardware Trade	20&5 %
To Wire Workers	25&5 %
Brass Milk Strainer Wire Cloth, to all Parties	10 %

Galvanized Twisted Wire Netting, by the bale	dis. 40 %
Galvanized Twisted Wire Fencing, by the bale	30 %
Rat and Mouse Traps	10 %
Nursery Fenders and Spark Guards	15 %
Steak and Oyster Broilers	10 %
Meat or Provision Safes	10 %
Riddles, Coal and Sand Screens	15 %
Clock Work Fly Traps, by the case	25 %
Round, Oval and Oblong Dish Covers	25 %
Wire Rope for Dumbwaiters, &c	35 %
" for Hoisting and Rigging	5 %
Wire Picture and Sash Cord, by the spool	50 %
Window Screens made to order	15 %
Plain and Ornamental Wire Work	20 %
Wash Stands and Towel Racks	20 %
Bank, Counter and Office Railing	20 %
Wire Fence, Guards, Doors and Cemetery	20 %
Wrought Iron Hurdles and Fence	20 %
" Hay Racks	20 %
" Stall Partitions	20 %
Cast Iron Stable Fixtures	15 %
" Crestings and Finials	10 %
Ship, Hand and Railway Lanterns	25 %
" " " Glass	10 %
All Extras	5 %

We make the following extract from their price list:

PRICE LIST OF IRON WIRE CLOTH.

The Mesh in Wire Cloth is the distance from the center to the center of the Wire. No length less than 100 feet shall be understood to be a Roll.

Hardware Grade, Iron Wire Cloth.

	Per Square Foot.
No. 2 Mesh, made from No. 18 Wire	$0·10
No. 3 " " 19 "	10
No. 3½ " " 20 "	10
No. 4 " " 21 "	10
No. 5 " " 22 "	10
No. 6 " " 23 "	10
No. 8 " " 25 "	10
No. 10 " " 27 "	10
No. 12 " " 29 "	10
No. 14 " " 31 "	10
No. 16 " " 32 "	10
No. 18 " " 33 "	10
No. 20 " " 34 "	12
No. 24 " " 35 "	15
No. 30 " " 36 "	19

Riddle Grade, Iron Wire Cloth.

	Per square foot.
No. 2 Mesh, made from No. 16 Wire	$0·15
No. 3 " " 17 "	15
No. 3½ " " 18 "	15
No. 4 " " 19 "	15
No. 5 " " 20 "	15
No. 6 " " 21 "	15
No. 7 " " 22 "	15
No. 8 " " 23 "	15
No. 10 " " 25 "	15
No. 12 " " 26 "	15

Stout Rice Wire Cloth

	Per square foot.
No. 8 Mesh, made from No. 20 Wire	$0·30
No. 10 " " 21 "	30
No. 12 " " 22 "	30
No. 14 " " 23 "	30
No. 16 " " 24 "	30

Heavy Iron Wire Bolting Cloth.

	Per square foot.
No. 30 Mesh, made from No. 30 Wire (Blued)	$0·45
No. 40 " " 33 "	50
No. 50 " " 35 "	60
No. 60 " " 36 "	70
No. 64 " " 37 "	75
No. 70 " " 38 "	80
No. 74 " " 39 "	90
No. 80 " " 40 "	1·05

This grade of cloth is wove and kept in stock 18 inches wide.

The increasing demand for Iron Wire Bolting Cloth has induced us to turn our attention more particularly to this branch of the business. The universal complaint and difficulty which every manufacturer has to contend with, is its liability to rust; this we have overcome most effectually by coating it with a preparation (known only to ourselves) in such a manner that no rust can touch it. Aside from this advantage, we feel confident in saying we can and do produce an article superior to any ever manufactured in this country. It is made of a larger wire, and driven up square, which, on an average, makes it equal to ten meshes finer per square inch.

Tinned Wire Cloth.

	Per square foot.
No. 16 Mesh Cloth	$0·13
No. 18 "	14
No. 20 "	16
No. 24 "	20
No. 30 "	30
No. 40 "	45

Wire Window Screen Cloth.

	Per square foot.
Plain Green or Drab, by the Roll	$0·8
Landscape, by the Roll, 1st quality	40
" " " 2d quality	30

Price List of the Union Emery Wheels, Cancelling all Previous Lists, Stone Center and Solid, Adopted March 1st, 1875.

WHEELS THINNER THAN THOSE NAMED WILL BE CHARGED AT THE NEXT THICKER PRICE IN THE LIST.

THICKNESS IN INCHES.

DIAMETER Inches.	¼	½	¾	1	1¼	1½	1¾	2	2½	3	3½	4	5	6	7	8	9	10	11	12	DIAMETER Inches.	No. of Revs per Min.
1	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	....	....	....	....	....	....	....	....	1	5,000
1½	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	....	....	....	....	....	....	....	....	1½	5,000
2	.20	.25	.30	.35	.40	.50	.60	.70	.80	.90	1.00	1.10	....	....	....	....	....	....	....	....	2	5,000
2½	.30	.40	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	....	....	....	....	....	....	....	....	2½	5,000
3	.45	.60	.75	.90	1.05	1.20	1.30	1.40	1.50	1.60	1.70	1.80	....	....	....	....	....	....	....	....	3	4,800
3½	.60	.75	.90	1.05	1.20	1.35	1.50	1.65	1.95	2.25	2.55	2.85	....	....	....	....	....	....	....	....	3½	4,100
4	.70	.90	1.10	1.25	1.40	1.60	1.75	2.00	2.25	2.50	2.75	3.00	....	....	....	....	....	....	....	....	4	3,600
5	1.15	1.15	1.45	1.75	2.05	2.35	2.65	2.95	3.55	4.15	4.75	5.35	6.55	....	....	....	....	....	....	....	5	3,000
6	1.50	1.50	1.80	2.50	2.70	3.10	3.50	3.90	4.70	5.50	6.30	7.00	8.40	....	....	....	....	....	....	....	6	2,400
6½	1.75	1.75	2.25	2.75	3.25	3.75	4.25	4.75	5.75	6.75	7.75	8.75	10.75	12.75	....	....	....	....	....	....	6½	2,250
7½	2.00	2.00	2.60	3.20	3.80	4.40	5.00	5.60	6.80	8.00	9.20	10.40	12.80	15.20	....	....	....	....	....	....	7½	2,000
8	2.25	2.25	2.95	3.65	4.35	5.05	5.75	6.45	7.85	9.25	10.65	11.05	13.85	16.65	....	....	....	....	....	....	8	1,800
8½	2.50	2.50	3.25	4.00	4.75	5.50	6.25	7.00	8.50	10.00	11.50	13.00	16.00	19.00	22.00	....	....	....	....	....	8½	1,700
9½	....	3.00	3.85	4.70	5.55	6.40	7.25	9.10	10.80	12.50	14.20	15.90	19.30	22.70	26.10	....	....	....	....	....	9½	1,575
10½	....	3.50	4.50	5.50	6.50	7.50	8.50	9.50	11.50	13.50	15.50	17.50	21.50	25.50	29.50	....	....	....	....	....	10½	1,500
12	....	4.00	5.25	6.50	7.75	9.00	10.25	11.50	14.00	16.50	19.00	21.50	26.00	30.00	34.00	38.00	42.00	....	....	....	12	1,200
14	....	....	8.00	8.00	9.50	11.00	12.50	14.00	17.00	20.00	23.00	26.00	32.00	38.00	44.00	50.00	56.00	....	....	....	14	1,050
16	....	....	10.00	10.00	11.75	13.50	15.25	17.00	20.50	24.00	27.50	31.00	38.00	45.00	52.00	59.00	66.00	....	....	....	16	900
18	....	....	....	16.00	16.00	18.00	20.00	22.00	26.00	30.00	34.00	38.00	46.00	54.00	62.00	70.00	78.00	86.00	....	....	18	825
20	....	....	....	20.00	20.50	23.00	25.50	28.00	33.00	38.00	43.00	48.00	58.00	68.00	78.00	88.00	98.00	108.00	....	....	20	750
22	....	....	....	....	....	29.50	32.00	35.00	41.00	47.00	53.00	59.00	71.00	83.00	95.00	107.00	119.00	131.00	....	....	22	675
24	....	....	....	....	....	36.00	39.50	43.00	50.00	57.00	64.00	71.00	83.00	95.00	107.00	119.00	131.00	143.00	155.00	167.00	24	600
26	....	....	....	....	....	44.00	48.00	52.00	60.00	68.00	76.00	84.00	98.00	112.00	126.00	140.00	154.00	168.00	182.00	196.00	26	550
30	....	....	....	....	....	....	....	68.00	75.00	85.00	95.00	105.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	30	500
36	....	....	....	....	....	....	....	100.00	110.00	120.00	130.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	280.00	300.00	36	400
42	....	....	....	....	....	....	....	130.00	140.00	150.00	165.00	180.00	210.00	240.00	260.00	280.00	300.00	320.00	340.00	360.00	42	340
48	....	....	....	....	....	....	....	150.00	160.00	170.00	180.00	195.00	225.00	255.00	285.00	305.00	335.00	385.00	415.00	445.00	48	300

[Entered according to Act of Congress, in the year 1875, by the Union Stone Company, Boston, Mass., in the Office of the Librarian of Congress at Washington.]

Regular Market Grade of Brass Wire Cloth.

	Per square foot.
No. 2 Mesh from No. 16 Wire	$0·50
No. 3 " " 17 "	50
No. 4 " " 18 "	50
No. 5 " " 19 "	50
No. 6 " " 20 "	50
No. 8 " " 22 "	50
No. 10 " " 23 "	50
No. 12 " " 24 "	50
No. 14 " " 25 "	50
No. 16 " " 26 "	50
No. 18 " " 27 "	50
No. 20 " " 28 "	50
No. 22 " " 29 "	50
No. 24 " " 30 "	50
No. 30 " " 31 "	52
No. 40 " " 33 "	55
No. 50 " " 35 "	58
No. 60 " " 36 "	60
No 70 " " 37 "	70
No. 80 " " 38 "	90
No. 90 " " 39 "	1·00
No. 100 " " 40 "	1·15

Brass Milk Strainer Wire Cloth.

	Per sq. ft.
By the quantity	$0·20
Less than 1000 feet at an order	22

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, Feb. 24, 1875.

Scotch Pig.—The market is active, and a large business has been done. Prices are advancing. The following are makers' quotations:

Gartsherrie, No. 1	89/
Coltness, No. 1	92/
Glengarnock, No. 1	86/
Eglinton, No. 1	76/6

Manufactured Iron.—No change to note in condition of the market, and quotations remain £9. 10/@ £10. 5/ for Best Staffordshire Bars.

Rails.—Market dull. Welsh are quoted £6. 10/@ £7. 5/.

IRON.

American Pig—The prospect of coal troubles has made the Iron companies indifferent to making sales, and some of them are holding at $30, but with few, if any, sales. We hear only of some Coleraine. There is, however, Iron in the hands of second parties, which can be bought at from $28 @ $29. Although a determined coal strike would greatly lessen the production of Iron, and considerably advance the price, consumers show no desire to buy in advance of their immediate wants, and business at present amounts to hardly anything. We quote No. 1 Foundry, $28 @ $30; Foundry No. 2, $26 @ $28; Gray Forge, $24 @ $28.

Scotch Pig.—The market is firmer on account of the probable increase of 10 per cent. in the duty. We quote now, Eglinton, $34; and Coltness, $38 @ $39. It is evident that any increased demand would advance the price, especially as our cable reports note an improvement on the other side.

Bar.—The demand is small, but it seems that it is still in excess of production, which is at present very small on account of strikes and severe frost. Stocks everywhere are very much reduced. We quote 2·8 cents for Eastern Mills, and Western, 2·4 @ 2·5 cents.

Rails.—We hear of the sale of 1200 tons of American at $48 at mills. We quote $48 @ $53 at mill.

Old Rails.—There is nothing doing, and we continue our nominal quotation of $27 @ $28.

Scrap.—The stock here is held at $34 @ $35, but we hear of no transactions.

METALS.

Copper.—The market has been steady and quiet, sales for the week having been restricted to 100,000 pounds Lake, on the spot, at 21¾c. Holders are not anxious sellers, and insist on 21¾c.; we consequently call the market tolerably firm at the close, at 21¾c. @ 21⅞c. Baltimore has, in a small way, brought 22c., but it is not easy to get cash for this figure. As for the general outlook, it is, if anything, reassuring. These first two months of the year have been exceedingly difficult ones, both from a commercial and industrial point of view. The freight movement to and from the far West has, during the present month, been beset with obstacles very nearly insurmountable in many instances; passengers have fared little better, and collections were in many localities absolutely impossible for weeks.

Consumption at the great centers of population has nevertheless been fair, and there are encouraging signs that the spring trade will be all the brisker. Even some of the railway supply manufacturing concerns have quite recently doubled their production compared with what it was a year ago, and an extra demand has thus been started, among other articles for India rubber for springs. We mention this in order to show that a more active time seems to be at hand, during which most of the articles that concern us more immediately are likely to be in demand at the low prices now prevailing. As regards Copper in particular, it is pretty generally conceded that manufacturers will re-enter the markets on an average toward the middle of next month, only the three or four larger brass mills holding what may be called a stock of the metal. The following telegrams came to hand from London: 20th instant.—Chili Bars, £83; Best Selected, £91. This shows a decline of 10/ in Bars and a rise of 30/ in B. S. To-day.—Chili Bars, £83. Best Selected had gone down to a figure out of all proportion low, and is now recovering. We would remark with reference to the European so-called visible supply contained in the London reports of the commencement of every month, that for the sake of comparison they adhere to the figures to hand from Chili and Australia by mail merely, whereas the visible supply ought to embrace the charters and afloats then known by cable. One of the reports has introduced the innovation, which appears commendable. The manufactures of Copper are steady, though quiescent, at the following rates: New Sheathing Copper, 28c.; Bolts and Braziers', 40c.; Bronze and Yellow Metal Sheathing, 21c.; and Yellow Metal Bolts, 28c., net cash.

Tin.—As announced by cable, Straits Tin declined on Saturday to £88. 10/, at London, the telegram adding: "Market dull, holders pressing sales." We are told by cable since, that the ten shillings were also lost. We refer to the passage in our Tin report of January 28, which gave the opinion of one of the London and Singapore Tin merchants, who expressed himself as follows: "I incline to the belief that Straits Tin in the more immediate future will sooner range near £90 than near £100, owing to the large shipments that will be made from countries in the East, including Australia, in January and February." Straits Tin at the time this was written stood £95. Now L and F is also wired £92 from London, a £2 decline. Nothing has occurred since to improve the statistical position of this metal; nothing, indeed, will or can mend it but a very large consumption both in Europe and America in the spring, and thence throughout the year, and even then it will be a precariously situated article, if Australia be found to again double its production this year, at a time when the Malacca Peninsula is also restored to its full capacity of supplying the markets. Singapore wires $24 per picul to-day; also, a decline of 50 cents for the week. In our own market nothing beyond a moderate jobbing trade has transpired, and we quote nominally, there being, in reality, no market at all—Straits, 21¼c., gold; L. and F., 21c.; English Refined, 21¼c.; and Banca, 25c., all gold. *Tin Plates.*—The market here has been tolerably active during the week from dealers' hands, while larger lines have not been sold. We quote firm the following rates: I. C. Charcoal, $9·75 @ $10, gold, per box; I. C. Coke, $7·62½ @ $8; Coke Terne, $7·25 @ 7·50; and Charcoal Terne, $8·50. The great strike in the iron and coal region in South Wales causes makers on the other side to feel diffident on the subject of their ability to deliver on contracts to the full extent of their engagements at the stipulated periods. A brisk spring trade here would therefore possibly bring about moments of scarcity in one sort or brand or another. Hence a strong undercurrent of confidence among us.

Lead.—Sales of the week have been but trifling, but seem to be on the point of becoming more extensive, the Selby Company's agent here having, it would seem, arrived at the conclusion that it will be good to part with a portion of the accumulated stock here, and a sale of the brand is rumored at 5·85c., gold, one lot of 125 tons on the dock being furthermore in treaty at a similar figure, it would appear. We therefore quote Domestic as yet dull at 5·85c. @ 5·90c., gold. The present moment is not a propitious one to throw large lots of Lead on the market, but if over production threatens to force prices later or to a still lower ebb, it will be good to have made a beginning with selling out at this early stage. Foreign is nominally still quoted 6⅝c. @ 6⅞c., gold, there being very little or next to nothing in first hands here. The entire decline in England during January has not exceeded 15/. England imported in 1874 62,217 tons, and exported 36,398. The manufactures of Lead have been fixed at the following manufacturers' selling rates: Bar, 8½c.; Pipe, 9c.; and Sheet, 9½c., less 10 per cent. to the trade.

Spelter.—A hope was entertained among the metal men last week that the weak parties had all sold out, but in this they appear to have been too sanguine, one brand still offering, it would seem, at 6·20c., currency, while the remaining ones cannot easily be had below 6⅝c. @ 6¾c., currency. This irregular state of affairs cannot last long, however, and we feel pretty sure greater steadiness will soon ensue. Should there have been an over production of Domestic Spelter, the loss which the present low figures seem to entail, will check such excess in the near future. Foreign has been selling in lots of a couple of tons at a time within the range of 7½c. @ 7¾c., gold, for Common to best brands Silesian. Accounts from Europe are firm and unaltered, with light stocks at the metal centers. *Sheet Zinc* is quiet at 9¼c., gold, 9 by 36.

Antimony—Continues to be quoted at £54 at London, while here we are quiet at 12½c. @ 12¾c., gold, according to quantity required.

OLD METALS, PAPER STOCK, &c.

The sales of Old Metals have been very light the past week, and dealers find it an impossibility to dispose of any considerable quantity. Old Rags and Paper Stock are improving slowly. The call from the mills appears to be rather more active, but as yet there has been only a slight reduction in stocks. Grass Rope is in good demand. Our quotations remain unchanged. The purchasing prices offered by the dealers are as follows:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 4½c.; Zinc, 4½c. @ 4¾c.; Pewter, No. 1, 18c.; do., No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1¾c.; Sheet do., ½c.; Cast, do., ½c.; Machinery, do., ¾c.

Rags, &c.—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No 1, 6c. @ 6½c.; No. 2, 2½c.; White, No. 1, 6½c.; No. 2, 4½c.; Colored, do.. 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 4½c. @ 5c.; Gunny Bagging, 1c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1½c.; Grass Rope, 2½c. @ 2⅝c.

COAL.

Thn plan of the Associated Coal Companies for the government of the Anthracite Coal trade to competitive points for the year 1875 has just been completed, and will take effect on the first of March. Five of the six transporting companies have entered into the agreement, and the Pennsylvania Coal Company, although not a party to the agreement, will conform to the plan during the shipping season. The monthly auction sales are to be abolished, and the price of Coal to competitive points is to be equal. The following is the programme:

NEW YORK, Jan. 21, 1875.

The undersigned committe report the following plan for the government of the Anthracite Coal trade to competitive points for the year 1875:

First.—Tonnage to competitive points for 10 months from February 1 to November 20, 1875, inclusive, to be 10,000,000 tons, and to be distributed among the six interests in the same proportion as that adopted in February, 1873, for the business of last year, viz.:

To the	Per cent.	Tons.
Philadelphia and Reading R. R. Co.	25·85	2,585,000
Lehigh Valley Railroad Co.	15·98	1,588,000
New Jersey Central R. R. Co. int.	16·15	1,615,000
Delaware and Hudson Canal Co..	18·37	1,837,000
Del., Lack. and Western R. R. Co.	13·80	1,380,000
Pennsylvania Coal Co.	9·85	985,000
Total		10,000,000

Second.—That a standing committe of six, composed of one representative of each interest, be appointed for the season, to meet monthly, or oftener, at the call of the chairman, to determine prices and all questions relative to tonnage to competitive points, and to have power, from time to time, to permit an increase, or require a curtailment of shipment to competitive points, with a view of regulating the relative demand and supply, provided that any increase or diminution of shipments be based upon the percentage of allotment above mentioned, so that each interest shall be entitled to its proper proportion of the aggregate competitive tonnage, whatever the same may be.

It is recommended that prices shall open in March, 1875, at an average of 15 cents per ton above the opening prices of 1873, and thereafter advance as follows: Say, in April, 5c.; May, 10c.; June, 10c.; and July, August, September, October and November, each 15c.; and that season prices be established so as not to be more than 30 cents below the average of the year.

The prices to be established, so as to admit the White Ash Coals of the Reading Railroad Company, Lackawanna, Scranton, Wilkesbarre and Pittston Coals upon equal terms to customers in New York harbor. It being understood that any interest may demand for any or all of its Coal a higher price than that agreed upon by the committee.

Third—In establishing prices, it is understood that they be fixed at the respective shipping ports of Port Richmond, Elizabeth, Port Johnson, South Amboy, Hoboken, Weehawken, Newburg and Rondout, and that no freights, deliveries or demurrages be guaranteed by any party, except with the previous approval of the Committee of Six.

Fourth—No commission whatever to be allowed upon Coal sold at yearly prices, and no contracts at yearly prices to be made with any one but consumers and retailers, and then only upon the condition that all cargoes of Coal so sold shall be received by the purchaser and taken upon the wharf, and not sold or transferred afloat.

No sizes to be sold at yearly or season prices, except Lump, Steamboat, Broken, Egg and Chestnut, and Egg only to consumers. No commission exceeding 15 cents per ton to be allowed to any party buying at monthly circular prices, and then only to such as purchase at least 25,000 tons of Coal per annum.

Fifth—All Coal sold at yearly or season prices to be sold by written contracts, deliverable in equal monthly proportions, beginning either on the 1st of March or 1st of April, and ending at any time after the 1st of November; and any failure to take all or any of one month's proportion to work a forfeiture *pro tanto* of each succeeding month's proportion.

Sixth—All deliveries of coal upon monthly allotments, at monthly circular prices, to be charged at the circular price current in the month in which the delivery is made, and under no circumstances whatever shall coal, delivered in one month, be charged at the circular price of any preceding month, unless the purchaser had a vessel at the shipping port ready to receive such coal before the expiration of the month in which the delivery was to be made.

Seventh—The terms of contract for the sale of coal at season prices, and by monthly allotments at circular prices, to be approved by the Committee of Six.

Eighth—No allowances to be made for impurity of coal, imperfection of preparation, short weight or any other reason without the approval of the Committee of Six, to whom all such claims are to be reported.

Ninth—The Committee of Six have powers to call for monthly or other reports for each interest upon any subject over which they have control, and to have authority, if they desire, to examine the sales and tonnage books and accounts of any company or corporation.

It will be seen that these rules reduce the price of coal twenty-five cents a ton from the rates observed in 1874. During 1873 the average opening prices were, for hard white ash coal, put on board vessels at Philadelphia, a fraction less than $4 a ton, and the prices advanced to $4·60 at the close of the season. The average opening prices in 1874 were $4·20, and advanced to $5·25 at the close of the season—an advance of $1 per ton during the year. In opening now at fifteen cents per ton average advance on the prices of March, 1873, the average prices for coal on board vessels at Philadelphia would be $4·15 per ton, and the average advance for the year would be eighty-five cents a ton, making the average closing prices $5 a ton, or twenty five cents per ton less than the closing prices in 1874.

We quote as follows: Anthracite, $4·75 to $6·30; Cumberland, $6·50 to $7; West Virginia, $7·40; James River Steam, $6·25; James River Carbonite, $9; Kanawha House, $14·25; American Gas, $7 to $7·25; American Cannel, $12 to $14; Pennsylvania and Westmoreland, $7·65; Murphy Run, $7·40; Newburg Orrel, $7·50; Sterling Ohio, $12; Ince Hall, $17 to $18; Liverpool House Cannel, $18; Liverpool Gas, $11; Newcastle Gas, $8; Scotch, $9.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending February 23, 1875:

Hardware.

Field A. & Co.
Mdse. pkgs., 139
Lau & Garliche,
Mdse. pkgs., 3
Robbins C. & Son,
Mdse. pkgs., 2
Schoverling & Daly,
Mdse. pkgs., 8
Ward A.
Mdse. pkgs., 3
Western Union Tel. Co.
Wire, lots, 793

Iron.

Henderson Bros.
Pig, tons, 50
Laughland & Co.
Hay bands, bdls., 450
Mdse. pkgs., 8
Pesant J. A.
Pipes, bdls., 40
Order.
Pig tons, 200

Steel.

Prosser Thos. & Son,
Mdse. pkgs., 26
Order.
Bundles, 442

Metals.

Ackerman D. H. & Co.
Antimony, bxs., 150
Harley Geo.
Scrap brass, pkgs., 10
Lamarche H.
Zinc, cks., 30
Marquez F.
Scrap, copper, bbls., 4
Phelps, Dodge & Co.
Tin plates, bxs., 8130
Zinc, cks., 156
Tin, slabs, 252
Tin, ingots, 456
Raynolds C. F. & Co.
Tin, cs., 1
Schoenberg Smelting and Refining Co.
Lead, cks., 17
Visser Simon de
Tin, slabs, 417
Order.
Zinc, cks., 86
Tin slabs, 328

PHILADELPHIA.

PHILADELPHIA, Feb. 23, 1875.

The Iron market has been active and excited during the week past, from fears of a scarcity of coal, which would cause all the furnaces of the Schuylkill Valley to blow out. Some of the furnaces of that region are already out from this cause, while others have purchased coal stocks from other furnace companies which have been idle for some time. As the collieries of the Wyoming region are at work, the Lehigh region is not likely to suffer, and it is stated that the Reading Company has arranged to supply some 50,000 to 60,000 tons of lump coal from storage points East, so that Schuylkill furnaces may be kept in. The effect of the scarcity has, however, been to cause an advance equal to $2 per ton in Pig Iron in the asking price, although actual transactions have not been as yet, to our knowledge, effected at more than 50 cents to $1 per ton higher. Stocks of Iron are materially decreased, most of the prominent companies being well sold up. Forge Pig is in demand by rolling mills at Pittsburgh at better prices, which indicates either a return of the boilers to work or fears of a scarcity. Foundry orders are being received, and the railroad companies are replenishing rolling stock, all of which, with the decreased production, would naturally have a tendency to strengthen prices, without any trouble in the coal regions.

Bars are somewhat stronger, and both light and heavy Rail sections generally sought. Old Rails are without material change, but the railroad companies are about the only holders, and they begin to stiffen prices. Scrap keeps well up, and is relatively the highest article in the market. Some large transactions are reported, particularly an unusually large sale of Allentown Pig Iron, which we fail to find substantiated. Prices are hard to quote and unsettled. The following represent the asking prices so far as Pig Metal is concerned, viz.:

PIG IRON—No. 1 Foundry, $30; No. 2, $28; Gray Forge, $26 to $27.

BARS—2·7c. to 2·8c. per lb.

RAILS—$50 to $53 at works.

OLD RAILS—$29·00 to $30.

SCRAP—$32 to $33.

The sales have been large and difficult to trace; the following are, however, reliable: 2000 tons No. 1 Foundry, $28 to $29; 1500 tons Gray Forge, $24, at furnace; 1000 tons do., low grade, private terms, at furnace; 1000 tons White and Mottled, $22, at furnace; 2000 tons Rails, 56s, $51, cash, at works; Old Rails, 2000 tons, at $29·50, here; Scrap, 500 tons No. 1 Wrought, at $32·50, here, and increased orders for Bars at quotations.

PITTSBURGH.

PITTSBURGH, Feb. 23, 1875.

PIG IRON.—There has been less activity in Pig Iron, as compared with last week, the recent advance, having checked the demand, but the general tone and spirit has, as yet, developed no signs of weakness; indeed, on the contrary, standard Forge Irons, as a general thing, are held at a further advance. The most of the mills, who have recently been buying all the lots that were offered at anything under current rates, have now withdrawn from the market, in hopes that by so doing they may be able to bring about a reaction, and as long as the lock-out continues they can afford to pursue this course, as the majority of them have more or less stock on hand and bought to arrive, and as long as their puddling furnaces remain idle they have no immediate use for the article. Producers, however, as a general thing, are in better condition to hold their product than they have been at any time since the panic, and, as already intimated, they are refusing to contract either for present or future delivery, except at very full prices. Some of the mills are buying Pig and sending it to other points to have it made into Muck Bar, after which it will be shipped back here again. But the most of those who have been buying recently have done so with a view of anticipating future wants, impressed with the belief that prices were lower than they will be when once the striking puddlers resume work again.

QUOTATIONS.

No. 1 Foundry	$27·00 @ 28·00—4 mos.
No. 2 Foundry	25·00 @ 26·00—4 mos.
Gray Forge	23·00 @ 24·00—4 mos.
White and Mottled	20·00 @ 22·00—4 mos.
Hot Blast Charcoal	30·00 @ 35·00—4 mos.
Cold Blast Charcoal	40·00 @ 50·00—4 mos.

MUCK BAR.—The general tone of the market, as might be expected, in sympathy with Pig Iron, is firmer, but there has been no quotable advance in prices as yet. Sales of some 9000 tons reported, mostly on private terms, but quotations may be fairly given at $43 to $45, 4 mos.

MANUFACTURED IRON.—Trade in all kinds of Finished Irons continues unsettled and unsatisfactory. In consequence of the lock out our manufacturers are making no effort to increase their business; they have no agents out soliciting orders, as they would but for the strike, and, beside, they are refusing to sell at rates offered to buyers by competing points west of Pittsburgh. Merchant Bars may be fairly quoted at 2·35c. to 2·40c., usual time, and notwithstanding it is said that Cincinnati is accepting orders at 2c. to 2·01c., orders have been refused here within the past week or two at 2·25 to 2·30. As might be expected, our manufacturers are loth to refuse, and to compel regular customers to go elsewhere for supplies, but they can see no object in booking orders at or below actual cost of manufacture, and it is certain that the more Iron those Western mills sell at current rates the poorer they will be.

NAILS.—There is more activity—orders are coming in more freely; the best evidence of which is that nearly if not all of the factories have been started up, but trade is not as active as usually is or should be at this season of the year, and, furthermore, it is claimed that current rates afford little or no margin for profit. Quotations may be fairly given at $3—60 days, with usual discount of two per cent. for cash. This is a further decline, and brings rates lower than they have been since before the war. There is no stock here, and manufacturers generally are determined not to carry any more than they can possibly help, and some of them aver that just as soon as their orders are not sufficient to absorb their production, that they will either curtail or shut down entirely. There is a fair demand for Horse Shoes, and prices are still maintained; $5·25 for 100 keg lots.

STEEL.—Orders continue to come in pretty freely, and the mills generally appear to have about all they can do, and the indications just now are reported favorable for a good, healthy spring trade; manufacturers complain more about prices than a scarcity of orders.

SCRAP IRON.—The Scrap Iron trade continues quiet, as compared with what it was about the time the lock-out was first inaugurated, but there is still some inquiry, and, with a light supply in the hands of dealers, prices are still maintained. No. 1 Wrought, $32 to $33, delivered free at mills. Scrap Steel is scarce, and some dealers report that notwithstanding the demand is light, they have difficulty in filling orders.

THE LOCK OUT.—It was thought a week ago that many of the puddlers would have been at work ere this, but it appears that they are determined to hold out a while longer, even if some of them with their families should have to rely upon public charity for subsistence, as it is said some of them have been doing for weeks past. It is only a matter of a little time, however; they will have to succumb in the end, as the mills cannot pay the old price for boiling, $6 per ton; it is simply impossible.

The Pittsburgh *Commercial*, of the 20th, says: The market for Pig Iron during the past week has been dull, the demand, which was fairly active last week having ceased entirely, and we can now report but few sales except such as were negotiated for previous to this week. At the date of our last report, it was supposed that by this time an arrangement would have been made between the puddlers and their employers, by which the mills would be started up by Monday next. It looks now as if the strike would not be ended for several weeks to come, and in conversing with several mill owners we find that they are not anxious to go to work even at the reduction asked for. For this reason the mill owners do not care to make any further contracts for Pig Iron, especially as the mills which have been running on Muck Bar, brought here from other sections, have been able to furnish all Iron that was wanted, thus leaving no demand for the product of the mills, which have been and are now idle. It is not expected that there will be much more demand for Pig Iron until the mills are ready to go to work. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM I. S. ORE.

250 tons gray forge	$24 00—4 mos.
200 tons gray forge	23 00— cash.
200 tons close gray	22 00— cash.
100 tons No. 1 foundry	27 00—4 mos.
100 tons No. 2 foundry	26 00—4 mos.
50 tons gray forge	24 00—4 mos.
50 tons white iron	19 00— cash.
40 tons No. 1 foundry	25 00—4 mos.

MUCK BAR.

600 tons muck bar	P. T.
500 tons muck bar	$40 00— cash.
400 tons muck bar	P. T.
300 tons muck bar	P. T.
100 tons muck bar, extra	42 50— cash.
100 tons muck bar, extra	42 50— cash.
100 tons muck bar	P. T.
50 tons muck bar	P. T.

CHARCOAL.

260 tons Nos. 1 & 2 foundry, H. R.	P. T.
50 tons No. 1 foundry, H. R.	$32 00—4 mos.

CONNELLSVILLE COKE.

500 tons gray forge, at furnace	$22 25—4 mos.
20 tons foundry, low grades	24 00—4 mos.

BLOOMS.

10 tons Juniata	$80 00—4 mos.

SCRAP IRON.

Dealers reported a fair demand without any quotable change in prices. The receipts continues fair. The asking rates are:

Car wheels	$34 00@25 00
Light scrap	28 00@30 00
No. 1 axles	38 00@40 00
No. 2 car springs	40 00
No. 1 moulding metal	18 00
No. 1 railroad scrap	28 00
No. 2 railroad scrap	25 00
Stove pipe and light iron	14 00
No. 1 wrought scrap	28 00@30 00

BOSTON.

FEB. 20.—*Pig* is nominally unchanged. The inability of holders to sell more than a five-ton lot at a time, unless the price recedes back to the January basis of $27·50 for No. 1, is fully apparent, and yet the willingness to shade prices will not draw out a liberal inquiry. The indifference previously noted is, if possible, more intense, foundry men having very little inquiry for work and no marked enthusiasm for the spring. This market might tone up in sympathy with the primary points, but the stock here, although not beyond that of previous seasons, is much larger than the dull times warrant, while immediately upon the commencement of a small stir here, or a trifling advance on little parcels, our receipts increase and the stock, instead of being less now than last fall, as it should be, is actually greater. Under the circumstances neither holders here nor assignors from the furnaces can hope for any permanent improvement until the New York speculation spurt has ended and the legitimate necessities of our stocks drive the foundry men into the open market. *Bar* is probably ⅛c. better toward the close of the week, more especially on Refined, for which one or two dealers quote 60c., equal to 2 7-10c. per lb., while there is little to be had in ordinary lots, even at 2⅝c., or $58·80 out of store. The demand for Common is slack. One Philadelphia Spike maker has visited our Eastern shipyards and taken liberal orders at $50, or 2¼c., on what he chooses to denominate "Boston Spikes." Rails have been selling very low at both New York and Philadelphia through the fall, and it is possible the orders will be filled and the quality satisfactory. The matter is worth the investigation of underwriters, more especially in view of a rumor current that a frame at Kennebunk spiked together with some stock now there had fallen to pieces. *Steel* is in moderate request and firm at 15c. to 15½c. for American Tool, 9½c. to 10c. for American Machinery, and 16c. to 17c. for English Tool. *Copper* is dull and somewhat easier. Buyers having no object for inquiries but speculation look for lower prices to encourage a movement, while holders, more hopeful of the future, are indisposed to shade down to the figures at which transactions might occur. The market is nominally 21¾c. to 22c., in reality a reaction on the ½c. nominal improvement of a week ago. We quote New Sheathing, 28c.; Bolts and Braziers, 30c.; Yellow Metal Bolts, 28c. *Lead* is listless and again lower, selling down to $5·90 in New York for small lots Domestic. Sheet and Pipe, 9c., currency; Tin-Lined Pipe, 16½c.; Bar Lead, 9c., less usual trade or 10 per cent. discount. *Spelter* is again lower and easy at 6¼c., currency. *Tin* is ¼c. lower for Spot Straits and in small request. We quote at 22c. for Straits. Refined English is dull for 21¾c., gold. Plates are firm; we quote Charcoal, I. C., $11·25 to $12·50; Coke, $9 to $10; and Terne at $8·50 to $12·50 per box, currency.—*Commercial Bulletin.*

CINCINNATI.

Messrs. L. R. HULL & Co., under date of Feb. 22, write us as follows: PIG IRON.—Business is restricted by the differences in views between buyers and sellers. Some sales have been made for future delivery at a shade above quoted prices for immediate delivery, but, as a rule, buyers are able to supply their wants at prices current the past 30 days.

HOT BLAST CHARCOAL.

Hanging Rock	No. 1	P ton.	$28·00 @ —4 mos.
" "	No. 2		27·00 @ —4 mos.
" "	Forge		25·00 @ —4 mos.
Tennessee	No. 1		26·00 @ 27·00—4 mos.
"	Forge		25·00 @ —4 mos.
Alabama	No. 1		26·00 @ 27·00—4 mos.
Missouri	No. 1		27·00 @ 28·00—4 mos.
"	No. 2		26·00 @ —4 mos.

HOT BLAST STONE COAL.

Missouri	No. 1	P ton.	$27·00 @ 28·00 —4 mos.
"	Forge		25·00 @ —4 mos.
Ohio	No. 1		26·00 @ —4 mos.
"	Forge		24·00 @ 25·00—4 mos.
Scotch Pig,	No. 1		26·00 @ 27·00—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock	Car Wheel	P tn.	$35·00 @ 50·00—4 mos.
Missouri	" "		43·00 @ 45·00—4 mos.
Kentucky	" "		40·00 @ 42·00—4 mos.
Tennessee	" "		36·00 @ 42·00—4 mos.
Georgia	" "		40·00 @ 42·00—4 mos.
Alabama	" "		40·00 @ 42·00—4 mos.
Machinery and Forge			40·00 @ 42·00—4 mos
Blooms			70·00 @ 90·00—4 mos.

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of Feb. 23: We have no improvement to note for the past week, orders are very scarce, and but little disposition is manifested to place same, even at cost to dealer or manufacturer. We quote the list unchanged, with quiet market.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ¾ to 1 thick..	2·6-10 to 2 7-10c. P lb.
1 to 4½ wide by 1⅛ to 2 thick	
Round and square, ordinary sizes, from	
¾ to 2 inclusive	2 6-10 to 2 7-10c. "
Hoop Iron, 1½ wide and upward	4½ to 4¾c. "
Band Iron, from 1¼ to 4 in. wide	3¼ to 3½c. "
Horse Shoe Iron ¼ to 1 wide by ⅜ to ½ thick	4 to 4½c. "
Norway Nail Rods	6¾ to 7c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15½ to 16c. "
Machinery Steel	11 to 11½c. "
Cast Spring Steel	10 to 10½c. "
Homogeneous Steel Plate	10½c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·87½
" Mule Shoes " "	6·87½

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per lb.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per lb.

R. R. Spikes 5½ by 9-16 at 3c to 3¼c. per lb.

Messrs. HOFFMAN, THOMPSON & Co., Iron commission merchants, 23 and 25 South Frederick street, under date of Feb. 23, report the Pig Iron market as follows: There have been large sales of Charcoal Irons this last week at about quotations, and holders are stiffer in consequence. There is considerable inquiry, but prices are not quotably higher.

Baltimore Charcoal Pig Iron		$32·00 @ 35·00
Virginia	" "	30·00 @ 35·00
Alabama	" "	27·00 @ 28·00
Anthracite	No. 1	27·00 @ 28·00
"	No. 2	25·00 @ 26·00
"	No. 3	23·00 @ 25·00
White and Mottled		20·00 @ 22·00

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of Feb. 20, report the Iron market as follows: The market here seems to be assuming a better and brighter aspect. The local demand is increasing, as is also Foreign. Sales are more numerous. Prices hold firm as quoted below, on 4 mos. time:

Mo. Stone Coal,	No. 1 F'dry.	$33·00 @	33·00—4 mos.
" "	No. 2 F'dry.	28·00 @	30·00—4 mos.
" "	Mill	27·00 @	28·00—4 mos.
" Charcoal,	No. 1 F'dry	31·00 @	33·00—4 mos.
" "	No. 2 F'dry	28·00 @	30·00—4 mos.
" White and Mottled		30·00 @	34·00—4 mos.
Tenn. Charcoal	No. 1 F'dry.	32·00 @	34·00—4 mos.
American, Scotch, "Cherry Valley"		36·00 @	42·00—4 mos.
Mo. Charcoal Blooms		75·00 @	80·00—4 mos.

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Feb. 22, writes us as follows: Good Forge Irons are scarce and command outside figures. Foundry Irons are firm but not in large demand. Cold Blast is still dull. The usual time, 4 mos., is allowed on quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from	Hanging Rock Ores	$26·00 @	28·00
" 2 "	" " "	25·00 @	26·00
" 1 Forge,	" " "	25·00 @	
" 1 F'dry, from	Tennessee Ores	25·00 @	26·00
" 2 "	" "	24·00 @	25·00
" 1 Forge,	" "	24·00 @	25·00
" 1 F'dry, from	Alabama Ores	25·00 @	28·00
" 1 " "	Iron Mountain Ores	28·00 @	30·00

HOT BLAST STONE COAL.

No. 1 F dry, from	Missouri Ores	28·00 @	30·00
" 2 "	" " "	27·00 @	28·00
" 1 Forge,	" " "	27·00 @	28·00

COLD BLAST CHARCOAL.

Car Wheel from	Hanging Rock Ores	40·00 @	50·00
" "	Tennessee Ores	35·00 @	38·00
" "	Alabama Ores	38·00 @	40·00
" "	Georgia Ores	38·00 @	40·00
" "	Missouri Ores	38·00 @	40·00
" "	Kentucky	30·00 @	40·00

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., Feb. 8, 1875.

THE GREAT STRIKE

in South Wales is still unsettled, and does not appear very likely to be brought to an amicable solution within a reasonable time. On Saturday the Dowlais Iron Company, Merthyr Tydvil, paid a week's wages to the 8500 or 9000 men recently in their employment; but in thousands of other instances the unfortunate unemployed are making application to the local guardians of the poor, and are asking for work. In numerous cases they offer to break stones for road mending and other similar purposes, and are brought to such a state of destitution that they offer to do this at one shilling per cubic yard for limestone, and fourpence more than that sum for similar quantities of harder stone. It is palpable that a very limited number of persons can be employed in this manner, hence it is not surprising to find that there is distress of an extreme description in the homes and families of those who are on strike. This week no wages are being earned in the principality, consequently no money will be put into circulation at the end of the week. Iron making is entirely at a standstill, and coal is beginning to grow so scarce that it has already become 5/ per ton dearer in South Wales, and may do so in other districts should the dispute remain unsettled for any length of time. Mr. Vivian, M. P., one of the associated employers, made a speech the other evening, in the course of which he brought forward a formidable and apparently unanswerable array of facts and figures justifying the employers in the steps they have taken. The only real gleam of hope in the situation is that the masters are willing to test the opinion of the men by a ballot, and will allow them to go in if a majority of not less than two-thirds consent to accept the reduction in wages, which is now the prime cause of dispute.

THE STATE OF TRADE,

generally speaking, is dispiriting and depressed. The iron districts are dull in all directions, there being little or nothing doing in either iron or steel rails, and no great amount in any kind of merchant iron. Ship, boiler and armor plates have still a good call, so that the firms devoted to their production have not so much to complain of as most of their *confreres*. Prices of finished iron are anything but strong, although some two or three of the best Staffordshire and Yorkshire producers adhere to their top figures very tenaciously. I will not, however, dwell on the subject, but give the

BOARD OF TRADE RETURNS

for the month of January, just issued. They show that we have not made a very good beginning in the new year, and the totals in most details compare unfavorably with January, 1874. The exports of coal were 781,047 tons, worth £578,938, against 916,116 tons and £943,861 in 1874; iron and steel, 154,737 tons, valued at £1,839,966, as against 150,364 tons, valued at £2,168,238 in January, 1874. I annex sundry details as to quantities and values in each period.

	Quantities.		Values.	
	1874.	1875.	1874. £	1875. £
Coal.....Tons,	916,116	781,047	943,861	573,839
Copper unw't, cwts,	14,326	19,561	65,798	89,111
" wrought	16,665	20,313	86,296	103,897
Hardware and Cutlery.....	....	....	362,931	340,376
Iron, pig....Tons,	43,242	54,169	265,226	232,785
Bar, angle, &c.....	15,779	17,812	211,964	191,907
Railroad.....	46,598	36,171	632,342	384,283
Hoops, sheets, &c.	10,736	13,796	196,819	219,619
Tin plates.....	10,946	10,003	835,076	292,040
Wrought.....	16,783	15,504	338,636	319,190
Old, for re-manufacture..	1,758	781	11,812	3,931
Steel, unwr't, tons,	1,962	2,658	78,743	72,972
Lead, pig, rolled, piping & tubing..	1,579	1,903	39,217	47,431
MACHINERY.				
Steam Engines.....	....	....	259,612	172,161
Other descriptions of machinery.....	....	....	524,576	450,330
Telegraph wire and apparatus.....	....	....	15,411	46,143
Tin, unwr't, cwts..	9,953	10,443	62,437	52,265

The exports of coal and coke were as under:

COAL, COKE, &c.
Month ended January 31.

	1874. Quantity. Tons.	1874. Value. £	1875. Quantity. Tons.	1875. Value. £
To Russia.....	13,518	14,314	3,932	2,973
Norway & Sweden..	30,158	30,291	40,907	27,055
Denmark.....	36,101	35,823	48,416	34,168
Germany.....	59,125	59,799	40,137	27,477
Holland.....	21,344	19,877	15,602	10,998
France.....	240,528	225,474	190,960	126,924
Spain and Canaries.	75,625	87,314	45,423	36,876
Italy.....	67,976	71,125	48,256	37,371
Turkey.....	15,634	17,366	9,365	7,283
Egypt.....	55,965	59,789	32,948	28,968
Brazil.....	12,972	14,626	22,838	21,305
Malta.....	35,405	37,759	7,470	5,485
British India.....	36,371	38,667	44,966	34,990
Other countries.....	225,494	241,737	239,827	177,095
Total.....	916,116	943,861	781,047	578,938

These figures show a drop of 135,569 tons in quantity and £364,923 in value.

Our exports of hardware and cutlery fell off considerably, except to British North America, which took the greatly augmented value of £16,425 worth. Details are these:

HARDWARE AND CUTLERY.
Month ended January 31st.

	Values. 1874. £	1875. £
To Russia.....	4,651	5,403
Germany.....	25,454	13,714
Holland.....	9,338	8,207
France.....	8,393	12,014
Spain and Canaries.....	9,896	8,599
United States.....	57,661	56,296
Spanish West India Islands...	3,539	3,921
Brazil.....	26,328	31,919
Argentine Republic.....	14,984	5,789
British North America.....	1,169	17,594
British India.....	26,818	20,943
Australia.....	49,954	60,338
Other countries.....	124,846	95,696
Total.....	363,931	340,376

On the other hand, we have despatched a slightly larger tonnage of iron and steel, but the values are much lower. Pig iron, hoops, sheets and armor plates show to advantage, but there has been a falling off of 10,427 tons in railroad iron.

IRON AND STEEL.
Month ended January 31st.

	1874. Quantity. Tons.	1874. Value. £	1875. Quantity. Tons.	1875. Value. £
Pig iron.....	43,242	265,226	54,169	232,785
Bar, Ang'e, Bolt and Rod.....	15,779	211,964	17,812	191,907
Railroad.....	46,598	632,342	36,171	384,283
Wire.....	1,944	46,440	3,637	64,856
Boiler, armor plates, &c.....	10,736	196,819	13,796	219,619
Tin plates.....	10,946	335,076	10,003	293,040
Cast or wrought...	16,783	338,626	15,504	319,190
Old for manufacture.	1,758	11,812	781	3,931
Unwrought steel...	1,962	78,743	2,658	72,972
Manufactures of steel and iron....	606	51,190	806	57,383
Total.....	150,364	2,168,238	154,737	1,839,966

IRON WORKS AND COLLIERIES IN CHINA.

It would be something more than strange if we, at some future epoch, should find our iron trade in the East ruined by "that Heathen Chinee." That dismal eventuality would, at any rate, appear to rank among the things which are possible, and at no very distant date we may find ourselves called upon to compete with Ah Sin, and possibly, in the end, be worsted by that "cheap labor" which Truthful James has felt called upon to curse so heartily. The more immediate facts leading to this conclusion are these, as given by the *Times*: Mr. Henderson, who has passed about 30 years in China, and who is now in England, has been commissioned by the Mandarins in charge of the Arsenals of Tien-tsin and Shanghai, in pursuance of instructions from his Excellency Li-hung-chang, Vice roy of the Provinces of Chihli and Superintendent of trade for the Northern treaty ports, to procure the necessary plan for working the collieries and iron mines, and for smelting and manufacturing iron in that province according to the most approved European methods. He has also been authorized to obtain the services of competent Europeans to direct the works. Attention has been repeatedly directed in the *Times* to the vast coal fields of China, and to the fact that steam coal, quite equal in quality to the best South Wales coal, abounds at Chaitang, in Chihli, about 40 miles west of Pekin. There is not at present a single coal mine in China worked on scientific principles; there is neither steam engine nor pump; and the smelting of iron is conducted only in the most primitive manner. Owing to the high prices which the Chinese are obliged to pay for foreign coal and pig iron—for the latter sometimes as much as £10 per ton—the authorities have determined to utilize some of their coal fields and deposits of iron stone, which as well as coal, occurs in great abundance in various provinces of China, and to work them in the most systematic and advantageous manner. The field which has been selected for commencing operations upon in the first instance is situated at P'ung C'hung, near Tre-chow in the county of Ta-ming-fu, in the southern part of the province of Chihli, and bordering on the province of Honan. It would have been impossible to select any locality richer in coal, iron stone and lime stone, or better placed with regard to facility of access. The field is situated on a plateau bordering on and about 300 feet above the level of the great plain of Chihli, and distant about twenty-five miles from some small rivers, down which the produce of the mines and iron works will be conveyed to Tient-sin. To complete the chain of communication it is intended to construct a rail tramway from the mines to one of the rivers in question. It is proposed, in the first instance, to meet the requirements of the national arsenals; but as soon as circumstances will permit, manufactured iron of all descriptions will be produced. In conclusion it may be mentioned, as a notable instance of neglect to utilize national resources, that the very locality in which the authorities are about to commence mining operations is referred to in an ancient Chinese history, some 2000 years old, as being the spot where the load stone was first discovered in China."

FOREIGN COMPETITION.

At the annual meeting of the Birmingham Chamber of Commerce, a day or two since, a report by the Council of the Chamber was presented, dealing with the question of foreign competition with our iron interests and the vexed question of capital and labor. The report states that the council, three years ago, predicted that the unhealthy inflation of prices and disturbed relations of capital and labor would drive much trade to foreign countries. This prediction has been verified to a large extent. Heavy contracts for rail and other iron, after having been unsuccessfully competed for in this country, have been finally placed on the books of Continental makers. The North American manufacturers have supplied their own country and their neighbors in Canada; whilst an unprecedented climax is afforded by the fact that cheaper iron of Belgian manufacture has been consumed by the Birmingham manufacturers of hardware themselves during the past year. According to the official returns of the Board of Trade, the total exports of iron of all kinds in 1874 were less than those of 1873 by half a million tons, and this in the face of an increased consumption in many parts of the world. In spite of these facts, the council are still hopeful. They remark that "the certainty of renewed strife has recently become apparent in the South Wales district, but it is to be hoped that firmness and patience on the part of all concerned will finally succeed in establishing an equitable and permanent basis for carrying on the business of producing coal and iron. The abundant corn harvest of last year may possibly have checked the depression in trade which was beginning to be seriously felt, and if the labor difficulties before mentioned can be fairly adjusted, there appears no reason why the trades of Birmingham, as well as the parent trades of coal and iron, should not enjoy during the present year a wholesome degree of prosperity, which may be all the more permanent for being free from the doubtful benefit of exceptional wages and profits."

SCOTCH PIG IRON TRADE.

In warrants no great amount was done at Glasgow last week, the fluctuations in quotations being consequently restricted to the limits comprised between 73/ and 74/. Shipping transactions, on the other hand, were on a very large scale, the returns showing that the shipments last week were 10,998 tons, as against 5635 tons in the corresponding period of 1874. The stocks in Connal's stores are 32,347 tons, these figures indicating the fact that the demand last week was in excess of the output, the balance having had to be taken from the stores. Freights are the same as heretofore, ballast pig iron being still quoted at 60/ per ton. Writing on February 5th, from Glasgow, Messrs. James Watson & Co. said: "We have to report a steady market during the week, warrants fluctuating between 74/ and 73/, closing buyers at the latter figure, sellers, 73/3. Shipments last week were 10,998 tons, against 5635 tons in the corresponding week of 1874.

	No. 1.	No. 3.
G. M. B., at Glasgow.....	76/	74/
Gartsherrie, "	90/	77/6
Coltness, "	91/	77/6
Summerlee, "	90/6	77/6
Langloan, "	91/	76/6
Carnbroe, "	85/6	76/6
Calder, at Port Dundas	90/6	76/6
Glengarnock, at Ardrossan.....	88/	77/6
Eglinton, "	77/	75/6
Dalmellington, "	78/6	75/6
Shotts, at Leith.....	88/	78/
Kinnell, at Boness.....	83/	74/6

Messrs. Swan Bros. prices current, of the same place and date, gives the following information:

Glasgow Brands.	Furnaces Blowing, 121	Furnaces Out 36.	Furnaces Built, 157.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie.....	13	3	16	90/	77/	..
Coltness.....	12	0	12	92/6	77/	..
Summerlee.....	6	2	8	95/	77/	..
Langloan.....	7	1	8	92/6	76/	..
Govan.....	5	0	5	76/	74/	..
Calder.....	6	2	8	90/	76/	..
Shotts { Bess'mer	5	2	7	92/6	87/6	..
Shotts { Ordinary			7	87/6	77/6	..
Carnbroe.....	4	2	6	85/	76/	..
Wishaw.....	2	1	3	..	..	..
Monkland.....	6	3	9	75/6	73/6	..
Chapelhall.....				..	..	..
Clyde.....	6	0	6	75/6	73/6	..
Quarter-Clyde....	4	1	5	75/6	73/6	..

* f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 2-5 No. 3, g. m. b., 73/3.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock.....	7	2	9	87/6	77/	80/
Ardeer.....	4	1	5			
Eglinton..... Brand'd	6	2	8			
Lugar..... Eglint'n	4	0	4	76/	75/	77/
Muirkirk	3	0	3			
Portland.....	3	3	6			
Dalmellington.....	6	2	8	78/	75/	72/6

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinneil.....	3	1	4	82/6	74/	72/6
Almond.....	2	1	3	76/	75/	..
Carron { Select'd	5	1	6	87/6	..	..
Carron { Ordn'y				80/	75/	..
Lochgelly.....	2	2	4	76/	74/	..
Cumphinnans.....	0	2	2	..	72/6	70/
Bridgeness.....	0	2	2	..	..	..

Furnaces in blast in Scotland..... 1875—121 / 1874—128

TRADES OF SHEFFIELD.

The half-yearly dividends of some of the local iron and coal companies have just been issued, and afford a pretty fair indication of what has been the actual state of trade during the past six months. The Staveley Coal and Iron Company pay £4 on their A shares, as against £5 for the same period of last year. The Sheepbridge Iron and Coal Company pay a half-yearly dividend at the rate of 12½ per cent. per annum, being £3. 8 9 for each £55 share, against £5. 10 in the corresponding half of last year. The British Wagon Company, however, pays 10 per cent., with a bonus of 1¼ per cent. free of income tax. The North Central Railway Wagon Company has made a profit of £9240 during the past year, out of which the "usual" dividend of 10 per cent. is recommended, with a bonus of 4 per cent. free of tax.

There have not been many transactions of importance in any descriptions of pig iron, but I hear of several pretty good negotiations for foundry pig on local account. Cleveland brands are held at about the following rates, delivered in this district: No. 1, foundry, 71/; No. 2, foundry, 67/6; No. 3, 66/; No. 4, 63/; No. 4, forge gray, 63/; No. 5, forge mottled, 61/6; No. 6, forge white, 59/; refined metal, 81/; Kentledge, 69/6; and cinder pig, 50/ per ton.

Transactions in hematite pig iron are on a very limited scale, in consequence of the continued great depression in the Bessemer steel and steel rail trades. Quotations are nominally about the following: Millom Bessemer, No. 1, 95/; No. 2, 92/6; and No. 3, 90/; ordinary No. 3, 90/; No. 4, 87/6; No. 5, 87/6; mottled, 105/; and white, 105/, on four months' terms. Maryport hematite, No. 1, 95/; No. 2, 95/; No. 3, 95/; No. 4, 90/; No. 5, M and W, 90/; Bessemer, No. 1, 100/; No. 2, 97/6; and No. 3, 95/, with the usual allowance for prompt cash.

As anticipated in my last week's communication, the 1st of the month has brought several alterations in the price of fuel, most of the changes being in a downward direction. The South Yorkshire Steam Coalowners' Association held an adjourned meeting at Barnsley on Tuesday last, and arrived at the determination to lower the price of local steam coal—which is, I hardly need remark, about the finest in the kingdom—sixpence per ton, that is, from 12/6 to 12/. This, I am informed, only applies to the cases of large buyers, and is not intended to disturb the quotations in the ordinary courses of the trade. In slack coal several of the colliery proprietors have reduced prices by 6d., 1/, and 1/3 per ton, owing to the full supply and poor demand. House coal is in some instances 1/ and 1/3 per ton easier. The Sheffield Coal Company's revised prices are these: Picked coal, 17/6; best Birley Silkstone 16/; screened Silkstone nuts, 8/6; screened seconds, 11/6; coke breeze, 11/; hard melting coke, washed, 18/; unscreened slack, 3/, all per ton of 21 cwt. at the pit month. These figures give an advance of 6d. on picked coal, and a reduction of 6d. per ton on some other qualities. It also appears to be a fact that one or two firms who advanced their prices 2/6 per ton about Christmas have thought fit to bring down their quotations to the level prevailing prior to that period. There are at present no indications of any reductions in the charges for soft coke of Northcountry production for steel melting purposes, contrary to the expectations of many of the cast steel manufacturers, who would be greatly benefited by any real change in this direction. It may be mentioned in this connection, that some of the best steel houses are again complaining of a paucity of orders, those now on the books being barely sufficient to give their workmen three and a half, or from that to four days per week. Some of the rollers are only being employed on four and five "turns" weekly, the melters being in a very little better position. It should, nevertheless, be stated that although the American and European demand is exceedingly quiet, there is a better tone in the home markets, many of the Birmingham and Sheffield tool manufacturers having just sent in their requirements for steel suited for the various classes of goods they produce. Sheet steel for pen making purposes is in steady request, being, as a matter of course, almost wholly produced for Birmingham consumption, with a few American orders now and then. It is also reported that cast steel ship plates are likely to be numbered amongst the things which are in current use, and that a development of this branch is not unlikely to be brought about very shortly. There is understood to be a fairly good output of special steel for rifles, bayonets, and general ordnance, mainly for our own government establishments. Steel wire is not much sought after, except for being made into colliery winding ropes and steam plowing tackle by the leading firms engaged in the latter branch of trade.

It will interest many of your readers to learn that the very old established businesses of W. J. Horn & Company and of Joseph & Robert Dodge, Sheffield, have been merged into one, and will in future be carried on under the designation of Joseph & Robert Dodge (Limited), Sheffield. The company so constituted is, I believe, in very few hands. It is registered as having a capital of £40,000 in £20 shares, and will deal in steel, cutlery, files, saws and edge tools, together with other hardware goods. Cutlery is still in limited request, except very good descriptions of table and special articles. Files and saws are not much sought after, but many firms are stocking. There is a very well sustained inquiry for stove grates and stoves, both on home and Australian account.

THE IVORY TRADE.

The following excerpt from *Dr. Livingstone's Last Journals* is interesting to cutlery men:

"England imports about 550 tons of ivory annually—of this 280 tons pass away to other countries, whilst the remainder is used by our manufacturers, of whom the Sheffield cutlers alone require about 170 tons. The whole annual importation is derived from the following countries, and in the quantities given below, as near as one can approach to actual figures:

Bombay and Zanzibar export.....	160 tons.
Alexandria and Malta.....	180 "
West Coast of Africa.....	140 "
Cape of Good Hope.....	50 "
Mozambique.....	20 "

"The Bombay merchants collect ivory from all the southern countries of Asia, and the East Coast of Africa, and after selecting that which is most suited to the wants of the Indian and Chinese markets, ship the remainder to Europe. From Alexandria and Malta we receive ivory collected from Northern and Central Africa, from Egypt and the countries through which the Nile flows. Immediately after the Franco-German war the value of ivory increased considerably; and when we look at the prices realized on large Zanzibar tusks at the public sales, we can well understand the motive power which drove the Arab ivory hunters further and further into the country from which the chief supply was derived when Dr. Livingstone met them.

In 1867	their price varied	from	£30	to	£42
" 1868	" "	"	39	"	42
" 1869	" "	"	41	"	44
" 1870	" "	"	41	"	44
" 1871	" "	"	41	"	44
" 1872	" "	"	58	"	61
" 1873	" "	"	68	"	72
" 1874	" "	"	53	"	58

"Single tusks vary in weight from 1 lb. to 165 lbs.; the average of a pair of tusks may be put at 28 lbs., and therefore 44,000 elephants, large and small, must be killed yearly to supply the ivory which *comes to England alone*, and when we remember that an enormous quantity goes to America, to India and China, for consumption there, and of which we have no account, some faint notion may be formed of the destruction that goes on amongst the herds of elephants. Although naturalists distinguish only two living species of elephants, viz., the African and the Asiatic, nevertheless there is a great difference in the size, character and color of their tusks, which may arise from variations in climate, soil and food. The largest tusks are yielded by the African elephant, and find their way hither from the port of Zanzibar. They are noted for being opaque, soft or 'mellow' to work, and free from cracks or defects."

SOUTH STAFFORDSHIRE AND BIRMINGHAM.

South Staffordshire iron is a little firmer, not by reason of any augmentation of demand, but owing to the paralysis of the South Wales district. So far, no orders have been transferred from the one to the other locality, but there is the possibility of such a step being taken, and there is also the fact that there is so much less competition to be taken into account. The Staffordshire and Birmingham tin plate firms are doing a steady business with the United States at 27/6 per box for R. K. P. coke, up to 28/ for Osler Bed best charcoal, f. o. b. Finished iron is in slow request at prices which in no respect differ from those given last week. In the hardware industries export orders are reported to be coming in more freely, particularly from the North European markets, for spring shipment. Russia, Sweden, Norway and Denmark are asking for implements, machinery and light domestic hardwares. Canada is also sending in requisitions for light hardwares and fancy articles. There is also said to be a much better tone in the American advices, indicating a good spring business with the Southern States in birding guns, steelwork, chains, traces, curry-combs, &c. The ammunition manufacturers are still busily engaged on old dated Spanish and German contracts, as well as on recently re-received cartridge contracts for Japan and Egypt. The manufacturers of light iron work are pretty fairly engaged, there being also a tolerably good demand for jewelry.

SOUTH WALES.

I have nothing to report of a trade nature from South Wales this week, the whole of the iron works being at present completely at a standstill. Until the strike is settled no work can possibly be proceeded with. The tin plate works are not, so far, greatly inconvenienced, as they are enabled to obtain a tolerable good fuel supply from the Forest of Dean. Should prices go up, however, to a much greater extent, the manufacturers will doubtless discontinue production temporarily.

THE METAL MARKETS

have been dull during the week, and prices are not now very strong. Von Dadelszen & North's report states that "*Copper* has been quiet, and little doing; the nearest price for Chili bars throughout the week has been £82. 10/. A small quantity of Wallaroo was done at £92. 10/, and Burra, £90. 10/. In English copper no change. By telegram received charters for last fourteen days January given as 1800 tons. *Tin* was pressed for sale, and declined 30/ per ton. Small sales on the spot were made at from £92. 10/ down to £91, and a considerable quantity to arrive at £91. 10/ down to £90. A somewhat better feeling is now ruling, and the nearest price on the spot is £91. 10/ to £92.; and to arrive, £90. 10/ to £91. Australian has been sold at £90. 10/ and £90 on the spot. Banca in Holland quoted 55½fl, Billiton, 54¾fl. English is dull, and obtainable at about £97 and £98 on the spot, while it has been sold for forward delivery at £96. Tin plates steady, and in fair demand. *Lead* is flat, and good soft English obtainable at £23. *Spelter.*—No transactions reported. *Quicksilver* £22."

The *Mining Journal* remarks: "*Copper.*—The market throughout the week has lacked animation, and so far as foreign produce is concerned there has been very little doing. Orders for shipment of manufactured have afforded the chief support of the market, and these have come forward in quantities sufficient to render quotations comparatively firm, and the business that has been done has been at full rates. Holders of Chili have been content to bide their time. Had this not been so, and had foreign copper been pressed upon the market in its present condition, the depreciation in prices would have been considerable. The market is in a very sensitive condition, and a slight increased demand for consumption, or the introduction of but moderate speculation, would probably result in a rapid rise in prices. On the other hand, it is not anticipated that, should the existing condition of the market continue, there will be any material fall in quotations. The charters from Chili for the last fortnight in January have been announced this day to be 1700 tons, the particulars of which have not transpired. Since the announcement the market has assumed a firmer appearance. At the beginning of the week Chili bars, g. o. b., changed hands at £82. 10/. During the week the price receded somewhat, and as low as £82 was accepted for a small quantity, since which quotations advanced to £82. 10/ buyers, but to-day business has been done at £83, usual cash terms, and the market closes firm. Yellow metal has been sold during the week at 8d per lb., but it is questionable whether manufacturers are not now firm at the official quotation of 8¼d. Manufactured, 4 by 4-India copper sheets are firm, at £90. The inquiry for India still continues. *Lead.*—The market throughout the week has lacked animation, but there is no change in rates. It is probable that an offer slightly below current quotations might be accepted. Good soft English pig is obtainable at £23, and Spanish, £22. 5/. *Spelter.*—The market for foreign has been inactive, and quotations remain about £23. 10/, for Silesian, and for English hard £17. A sale of Australian ingots by auction is reported to have taken place at £21 per ton. *Quicksilver.*—Business has been done this day at £22 per flask. *Tin.*—There has been very little variation in this metal during the early part of the week, but yesterday a considerable business was done in Straits at from £90 to £91, 10/, cash, and from £90 to £91 for parcels for shipment from January to March, the more distant shipments fetching the less price. To-day the market has been firm, and quotations for Straits have advanced to £91 and £92. Australian rules £90 to £90. 10/, and English ingots are quoted £98. *Tin Plates.*—Some makers report a fair supply of orders, others are somewhat bare. Quotations remain unchanged, and as the season advances, a fair trade is expected.

Latest Liverpool iron and metal prices are these:

Iron; f. o b in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Merchant bar.....	8	15	0 @	9	0	0
Merchant bar, in Wales....	8	5	0 @	8	10	0
Staffordshire.....	9	5	0 @	11	15	0
Hoop.....	10	15	0 @	11	15	0
Sheet.....	12	10	0 @	13	10	0
Nail rod.....	10	0	0 @	10	10	0
Bar, best crown.....	9	5	0 @	9	10	0
Boiler plates.....	12	0	0 @	13	5	0

Tin Plates: f. o. b. in Liverpool, per box.

	£	s.	d.	£	s.	d.
Charcoal, I. C.....	1	14	0 @	1	17	0
Coke, I. C.....	1	8	0 @	1	10	0

Copper: Delivered in Liverpool, per ton.

Bolt and Sheathing.....	£98 @ £100
Tile.....	90 @ 91
Tough cake.....	91 @ 92
Best selected.....	92 @ 94

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, Feb. 7, 1875.—*Metals.*—Although money is easy, the aspect of affairs in the north of Europe is by no means a cheerful one. The lock-out in South Wales, which we alluded to in our last general review as impending, has taken place. Telegraphic advices to hand this day represent the spirit which animates the men out of employ as being sullen and indifferent. The crops having been bountiful, the men may deem themselves in an exceptionally favorable position for wearing out the patience of their employers. It is to be hoped, however, that arbitration may be resorted to, the now-a-days most approved and practical method of overcoming a colossal evil of the kind, and that the difficulty will be speedily got out of the way. As it is, the new year has offered no features yet in the metal trade, which Europe has any reason to congratulate itself upon; on the contrary, all we have thus far had to chronicle has been a steady decline in values, and the operators for a fall in both Copper and Tin have had it pretty much all their own way since January 1. The Chilean Copper charters for the latter half of January have, however, been moderate, summing up as they do but 1700 tons, but it was about time that there should be a falling off, and the rapidly declining tendency stayed. Calculating the charters from the West Coast to hand by mail only, it will be found that the visible supply, without counting the Australian afloats, amounted to 30,164 tons at the three English centers and Havre, against 36,651 and 42,242 in '74 and '73. But when we come to add the amount afloat from Australia, and the Valparaiso cable afloats and chartered, it will be seen that the visible supply is 36,440 tons instead. As for the deliveries, they have on the other hand been quite fair in January, summing up for England and this country 5875, against 4963 and 3603 in '74 and '73, and proving a steady progress, despite the complaints of general dullness. Another satisfactory show is presented to the metal trade in the official statistics of English imports and exports for 1874, and the preceding two years; thus, while England imported 58,824 tons of pure metal against 55,281 and 68,413 in '73 and '72, the export amounted to the large figure of 64,998 against 59,946 and 50,147. The headway made in the latter item during a year of comparative prostration in most branches of the metal trade speaks volumes in favor of Copper, and the liberal deliveries in January seem to hold out an encouraging prospect for the season just opening. Very little transpires in the metal at Paris, where we sustain the figures of the late decline with some difficulty, and quote Chili Bars, 216 francs; Common ditto, 212; Ingots, 227·50; Tough Cake, 227·50; and pure Corocoro Ore, 217·50. Havre remains quiescent at the following rates: First brands, Chili, 222·50 to 225; current, ditto, 217·50 to 220; and Lota and Urmeneta, 215 francs the 100 kilos. Marseilles remains unaltered. Speculators there are doing their best to kelp sustaining the English markets from a distance, while consumers keep aloof, or nearly so. *Tin.*—Opinion is very much divided upon the subject of this metal, and the prospect which there may be or may not be of sustaining values in the immediate future. It is claimed that the aggregate consumption of something like 27,000 tons last year encourages the belief or hope that prices, after the recent decline, may now be considered safe, and that the late heavy arrivals from the Straits need not over much alarm the holders of the metal, these supplies not coming unexpected. Yet the returns of the English import of Australian for January again show an increase, having been 696 tons, against 622 and 112 in '74 and '73, and the amount afloat of the same description on the 1st instant was 1500 tons, against 723 and 588 in '74 and '73, while the entire visible supply in Europe on that date was 9648 tons, against 6011 and 3355 in '74 and '73. With such figures before us, the wonder is that Tin has been as well sustained as was the case. Thus the quantity actually thrown on the European markets in January was 2875 tons, against 1686 and 692 in '74 and '73, while the deliveries were 1279, against 606 and 947. The next Dutch sale is likely to come off toward the close of next month. Greater firmness has been observable in this market. We quote Banca, deliverable at either Havre or Paris, 272·50; and Straits or English, 250. The Calm reported from Marseilles in our last has not been relieved, and the telegraphic quotation from there to-day stays at 250 for Straits as a basis. *Lead* is not in a prosperous condition; it is devoid of life in the London market, where good Soft English is feebly sustained at £23, and Spanish at £22. 5/. Rates here are altogether nominal at 59 francs, French, deliverable here; 58·50 Spanish at Havre; and 59 Belgian and German here. Marseilles is quiet at 53. *Spelter.*—Inactivity is reported from London on the basis of £23. 10/ Silesian, while here we are steady at 63·50 to 64 francs, according to brand, deliverable at Havre. Marseilles remains steady, and a moderate consumptive demand seems to be kept up in that locality. *Iron.*—It will depend a good deal on the developments in England with respect to the labor question, whether or not a temporary suspension of work in neighboring countries is to come to the assistance of the French Iron districts or not, and with a due regard to what may turn up in this respect it would be in vain to attempt forecasting the future. The predominant feature in our markets is one of quiet, so far as large orders are concerned, while small ones are flocking in pretty steadily. As for the general sentiment entertained it is one of confidence in the future. *Coal.*—What we have just said with reference to Iron applies equally as well to Coal, which remains quiet, but inspires confidence at ruling rates.

BELGIUM.

(Le Commerce.)

BRUSSELS, Feb. 7, 1875.—*Iron.*—The attention of our Iron masters is drawn off a good deal for the time being from the by no means cheerful state of affairs in the Belgian Iron districts, and engaged in canvassing the chances involved in the Welsh lock-out. Should a prolonged suspension of work ensue therefrom, it is fair to presume that increased activity would soon be perceptible in the Iron and Coal districts of our country. The feeling here, altogether abstracting from the English labor question, is, despite the present paralyzation, not one of hopelessness; on the contrary, it is generally conceded that legitimate consumption will make itself vigorously felt with the opening of the spring campaign. This, so far as Iron is concerned. As for *Coal*, large supplies of Coal for industrial purposes are accumulating, consequent upon the general inactivity observable in the Belgian industrial regions, nor has the demand for domestic purposes fully come up to expectations. As regards our export of Coal to France, the railway system now completed begins

to absorb the trade to the detriment of canal transportation in a most striking manner. We furthermore beg to mention that metallic cables for Coal transportation across valleys begin to be more and more introduced among us.

GERMANY.

(Borsenhalle.)

HAMBURG, Feb. 5, 1875.—*Metals.*—The Chamber of Commerce of this city has just issued its annual statistics of the trade of this port, according to which the import and stocks of *Spelter* have varied as follows during the past 19 years:

	Import. Centweights.	Stock. Centweights.
1874	190,000	....
1873	223,000	15,000
1872	100,000	10,000
1871	169,000	45,000
1870	200,000	30,000
1869	236,000	40,000
1868	265,000	40,000
1867	399,000	50,000
1866	345,000	30,000
1865	315,000	20,000
1864	520,000	55,000
1863	292,000	28,000
1862	295,000	100,000
1861	278,000	54,000
1860	245,000	80,000
1859	370 000	65,000
1858	265,000	35,000
1857	378,000	35,000
1856	360,000	40,000

The bulk of this Spelter came down the river from the Silesian mountains. The great falling off in 1874 and 1872 has to be accounted for, on the one hand, by the low state of water in the river Elbe and its tributaries, and on the other to the competition on which Stettin is making us by drawing off direct a large share of the product of the Silesian mines for reshipment thence either North or to England. The *Spelter* market here has been quiet for the lack of an available supply. Breslau remains firm at 23·75 marks. *Copper* has been inactive, and the dealings have been restricted to supplying the requirements of consumers. There is no change. *Tin* also lacks animation, while quotations are nominally sustained. *Lead* continues feebly supported at 24 to 25·50 marks, German, according to brand; 25·50 to 26 English, and 25 to 25·50 Spanish.

RUSSIA.

(Journal de St. Petersburg.)

ST. PETERSBURG, Feb. 4, 1875.—At a recent meeting of the Russian Technical Society, some data of interest were reported respecting the mineral resources of the Sirdarya country. Aside from the discovery of lead, salt and other minerals, promising a flourishing trade, there is some abundance of coal, which mostly occurs in nests in the hills, while of large coal fields but few have hitherto turned up. The most extensive ones are those of Kokine Sai, near Chodshent, containing at the lowest estimate some 19,000,000 pood.* Next to these rank the Tatarinoff mines, from which 300,000 pood of the best coal have been already taken, and the annual output of which averages 70,000 pood. Coal being scarce in Russia, any discovery of it is deemed of importance.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Feb. 2, 1875.—*Tin.*—Since the auction considerable sales of Banca have been effected at 56·10 to 56·25 guilders, while March futures have been done at 56·25, Billiton, April futures, at 54·50, and March, ditto, at 54¾. FEB. 6.—The market remains quiet. Banca on spot has sold at 56¼, 56·10 and 55¾, while deliveries from the March sale have from 56¼ declined to 55½; Billiton, March futures, have brought 54¾, and from on board 53½.

AFRICA.

(Alexander Duff & Co.)

PORT LOUIS, Mauritius, Jan. 8, 1875.—*Galvanized Iron* is steady at $9·75 to $10 the 100 pounds; *Tin Plates* are sustained, I. C. at between $9·75 and $10 per box. The Coal market has been moderately active; English may be quoted $11·25 per ton; Australian, $9 to $10, late sales kept private, and Scotch, $10. *Exchange.*—Oriental bank bills on London, 60 days' sight, 9 per cent. premium.

EAST INDIES.

(Aitken, Spence & Co.)

COLOMBO, Ceylon, Jan. 13, 1875.—*Plumbago*—There is but a limited business doing, and prices are unchanged. Supplies small. We quote, free on board with commission, and exchange at par, cleaned, including packages, per ton and duty, Lump, 336/; Chip, 189/; Dust, 126/; freight to New York, 75/ per ton. The market closes quiet, but steady. Shipments from Colombo and Point de Gale to the United States from Oct. 1, to date, 3116 cwts. against 15,180 during the corresponding period last year; to the United Kingdom, 24,926; to the Continent of Europe, 731. *Shipping.*—The Queen of the Fleet is nearly ready, and will likely sail this week. The Hope, 449 tons, was chartered a day or two ago, to load for New York via Aleppy, taking about 200 tons weight from here on charterers' account, and filling up at Aleppy. *Exchange.*—Bank rates have been steady during the fortnight. Private credits, 1/11.

European Orders for Chrome Steel.—The Chrome Steel Company, of Brooklyn, have been filling European orders for chrome steel for some time past, chiefly in little sample lots of a few hundred dollars worth at a time. Last month an order was filled for chrome steel to the value of $2000 in gold, and the company now have foreign orders on their books for a very large quantity, which they are now packing for shipment. The extraordinary mechanical properties of chrome steel, its remarkable tensile strength (198,870 pounds to the square inch) has attracted attention abroad, and will probably command for it many European orders. The difficulty experienced by blacksmiths in tempering this steel results from ignorance of the proper methods of treating it. For the benefit of purchasers the company have issued a little manual giving directions for forging, tempering, annealing and welding their steel, and they guarantee that steel worked according to directions will always give entire satisfaction.

Improved Rolling Mills.—The invention of Messrs. Stamford & Bott, of Masborough, relates to improvements in rolling mills, or machinery for rolling iron and steel wire, or other like sections of rolled iron and steel. For this purpose, a wrought iron carrying bar is arranged below the rolls so as to work in a slide with brass bearings to carry the bottom loose spindle, which rises and falls, to suit any diameter of rolls, and can easily be adjusted as the brasses wear thinner, until the brasses are worn through, thus effecting a great saving in the brass bearings. The chucks and brasses for the necks of the rolls are about half the usual size, the brasses being held in the chucks by dovetails, which are cast solid on to the back of the brass bearing. A brass is pressed down on the neck of the bottom roll by a spring, which also presses the chuck and brass up against the neck of the top roll. The point of the guides are kept in their proper place by pins, or studs, which work through a peculiar formed nut; the guides are also held firm by the studs and wedges. The guide box is held firm in its position by bolts and bearers, secured in the standards. Springs are arranged under the gland of the standards to keep the glands perfectly steady. The glands are screwed down so as to put a constant weight or pressure on the necks the rolls.

* The weight of a pood is about 44 pounds English.

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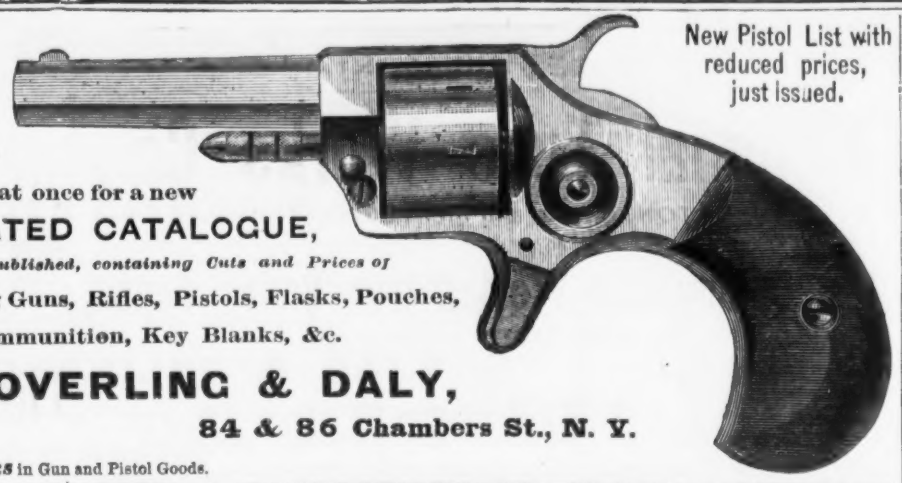

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No. 1, weight	16 lbs.,	cuts	⅜x2	inch, or	½	inch round or square	Price $25·00
No. 2, "	165	"	⅝x3	"	¾	" "	" 50·00
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This is by far the most powerful Iron Cutter in use which can be worked by hand, having three times the capacity of any other machine which sells at the same price. The No. 3 machine occupies a space of 12x30 inches; when in use additional space must be had for the lever to work in. We send two sets of knives with each machine—one for square and flat, the other for round iron and steel. By using the knives adapted to it, round iron is cut without being flattened. One man can cut the largest size iron named above, but two would be required for steady work. It does not take a minute to change the knives or to shift the machine from large to small sizes.

Many times we go without iron rather than ask a hardware dealer to cut us off such a piece as we want, it seems to be such hard work for them to do it with cold chisels. No dealer with this machine in his store will look sad when you ask for half a bar of iron, as he can furnish it in two seconds, with no waiting on your part or trouble on his. The cost of cold chisels will more than pay the interest on this machine in almost any iron store. In all kinds of shops where iron and steel are to be cut this machine will soon pay for itself. We have a large number of letters, from persons who are using the machine, speaking of it in the highest terms, and we can truthfully say that we have never put a new machine upon the market which worked its way more rapidly and surely into public favor than this one.

We make a satisfactory discount to dealers, and warrant the cutters to do all which we claim for them. Send for prices.

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Our New Vise combines all the advantages of the "Peter Wright" Leg Vise, of strength and lightness, fastening to the floor and bench, and at the same time greatly superior to it; is always perfectly parallel at all points of opening, and never gets out of line. Embodying the same general principle as the well known Chain Vise, so long made by us, we have by new, scientific proportioning of all the parts, and with our recently improved metals for their manufacture, obtained so perfect a tool, that we now *warrant* these Vises for *three years* from date of manufacture stamped upon each.

The Jaws are of best Tool Cast Steel, welded on, file cut and properly hardened. The screws are forged of the best refined iron, and work in *solid cut thread* boxes.

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No. 1,	Jaws 3½ in. x ⅞ in.	Screws	⅞ in.	diameter.	Lever	9 in.	long,	Opens 4¼ in. $8 00
" 2,	" 4½ in. x 1 in.	"	1⅛ in.	"	"	13 in.	"	" 5¼ in. 12 00
" 3,	" 5¼ in. x 1⅜ in.	"	1¼ in.	"	"	16 in.	"	" 6⅜ in. 17 00
" 4,	" 6¾ in. x 1¼ in.	"	1⅜ in.	"	"	19 in.	"	" 7⅞ in. 22 00
" 5,	" 7 in. x 1⅜ in.	"	1⅝ in.	"	"	24 in.	"	" 9 in. 30 00
" 6,	" 8 in. x 1⅝ in.	"	1⅞ in.	"	"	26 in.	"	" 10 in. 34 00

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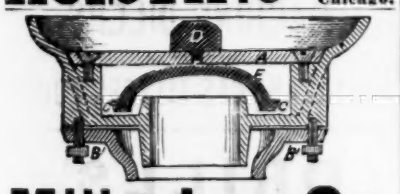

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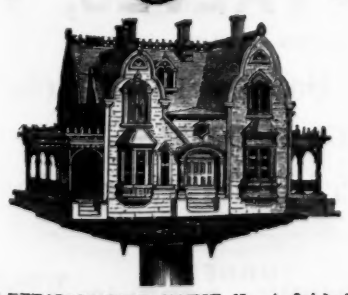

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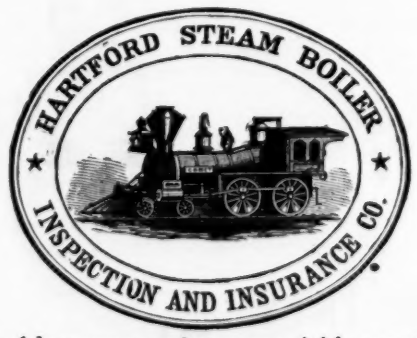

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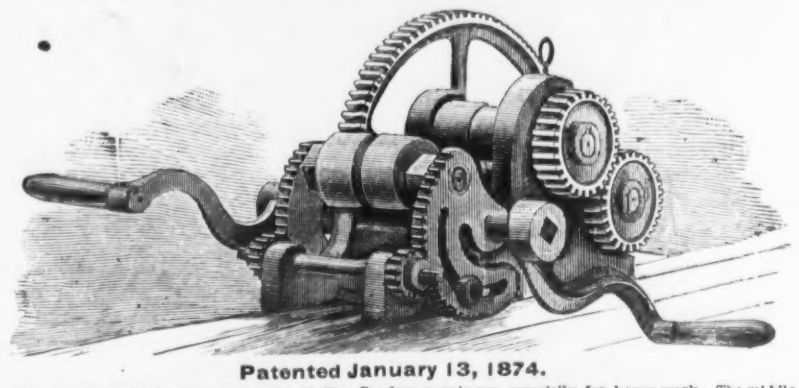

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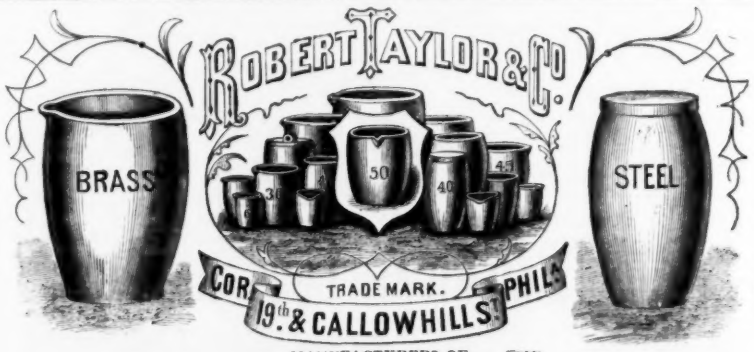


MANUFACTURERS OF

BLACK LEAD CRUCIBLES

Of all Sizes and Forms for melting

Steel, Brass, Gold, Nickel and all kinds of Metals.

Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

ROBERT TAYLOR & CO.,

No. 1900, 1902, 1904 & 1906 Callowhill, St., Philadelphia.

General Agents. { **MERCHANT & CO.,** 507 Market Street, Philadelphia. **PARK & CO.,** 122 Second Avenue, Pittsburgh, Pa.

NEW MODEL DERINGER REVOLVER.

22 Cal. 7 Shot.

An exact model of S. & W. No. 1 Revolver.

This arm is Half Nickel Plated, and is equal in style of finish to the best arms in the country. Quality of workmanship and material first-class, and guaranteed in every respect.

Price less than any other Hinge Barrel Cartridge Revolver in the market.

Sole Agents, EDWARD K. TRYON, Jr. & CO., { Dealers in **FIRE ARMS.**

No. 19 North Sixth Street and No. 220 North Second Street, PHILADELPHIA.

NEW HAVEN NUT COMPANY

MANUFACTURERS OF

HOT PRESSED NUTS,

Factory and Office, - - WESTVILLE, CT.

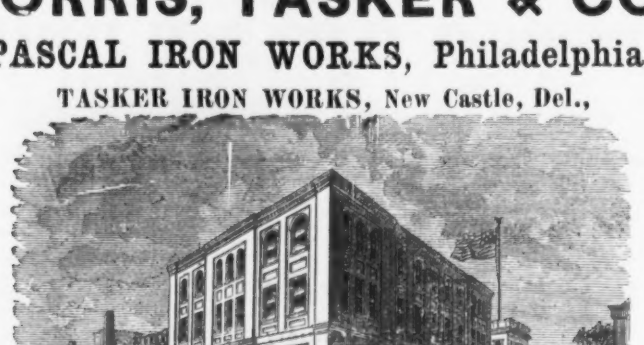
Pipe, Fittings, &c.

Thomas T. Tasker, Jr. Stephen P. M. Tasker

MORRIS, TASKER & CO.,

PASCAL IRON WORKS, Philadelphia,

TASKER IRON WORKS, New Castle, Del.,



Office, Fifth and Tasker Streets, Philadelphia.

Office and Warehouse, No. 15 Gold Street, New York.

Office and Warehouse, No. 36 Oliver Street, Boston.

MANUFACTURERS OF

WROUGHT IRON WELDED TUBES,

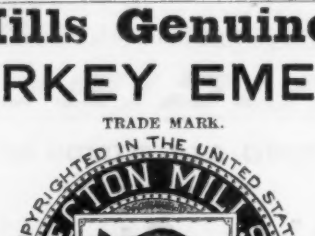
Plain, Galvanized and *Rubber-Coated*, for Gas, Steam and Water.

Lap-Welded Charcoal Iron Boiler Tubes.

Oil Well Tubing and Casing, Gas and Steam Fittings, Brass and Steam Fitters' Tools, Cast Iron Gas and Water Pipe, Street Lamp Posts and Lanterns, Improved Coal-Gas Apparatus, Etc.

Ecton Mills Genuine London TURKEY EMERY.

TRADE MARK.



ABBOTT & HOWARD, Agents for the United States.

81 John Street, New York. 35 Oliver Street, Boston.

BAILEY'S PATENT ADJUSTABLE PLANES.

Thirty different styles in

IRON AND WOOD. 80,000 ALREADY IN USE.

Smooth Planes,
Jack Planes,
Fore Planes,
Jointer Planes,
Block Planes,
Rabbet Planes,
Circular Planes.

Carpenters,
Cabinet Makers,
Car Builders,
Carriage Makers,
Millwrights,
Wheelwrights,
All Use them

Manufactured by the **STANLEY RULE & LEVEL CO.,**

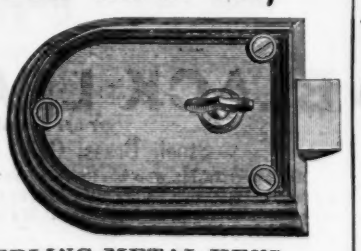
Factories: New Britain, Conn. Warerooms: 35 Chambers Street, New York.

AMERICAN LOCK MFG. CO.,

Manufacturers of

FELTER'S

Locks & Latches,



Comprising

Store Door Locks, Night Latches, Drawer, Desk and Pad Locks,

All of which are furnished with

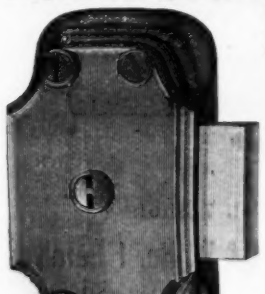
SMALL, FLAT, AMERICAN STERLING METAL KEYS,

Which are stronger than steel, ***and cannot be affected by rust,*** and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, ***they will rival the best made Locks in Finish and perfect operation.***

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having ***thirty-five*** finely finished Brass Tumblers in each Door and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs, which cannot be said of any other patent Tumbler Locks in use.



THE LOCKS ARE FITTED TO THE KEYS,

And not the Keys to the Locks,

Hence Counterfeit Keys cannot be made.

For descriptive list and terms, address,

UNION NUT CO., Sole Agents,

78 Beekman Street, New York.

New Patent "X" Razor Strap.

PATENTED DECEMBER 23, 1873.

This Strap, designated on our List as Letter "X," is of novel construction—is elastic, pleasantly yielding to the razor—gives a keen fine edge—is made of superior stock—is furnished at a low price—**and gives universal satisfaction.**

ITS PRICE SELLS IT.

BENJAMIN F. BADGER, Sole Manufacturer,

Badger Place, Charlestown, Mass.

Pipe, Fittings, &c.

National Tube Works Co.,

BOSTON, MASS. and McKEESPORT, PA.,

MANUFACTURERS OF

Best Quality Lap Welded Iron Boiler Tubes,

STEAM AND GAS PIPE,

Artesian Oil and Salt Well Tubing and Casing,

With Patent Protecting Coupling;

Mack's Patent Injector for Feeding Boilers.

JAMES C. CONVERSE, President, McKeesport. WM. S. EATON, Treasurer, Boston.

New York Office and Warehouse 78 William cor. Liberty Street.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS

For STEAM, WATER and GAS.

Wrought Iron Pipe & Fittings, Plain and Galvanized

PLUMBERS' MATERIALS.

Illustrated Catalogue sent by express to the Trade on application.

Factory, Paterson, N. J. 56 John Street, N. Y.

PANCOAST & MAULE

227 Pear St.

PHILADELPHIA.

WROUGHT IRON PIPE

FITTINGS, BRASS & IRON VALVES & COCKS

TOOLS & STEAM FITTERS SUPPLIES &c.

PIPE CUT & FITTED TO PLANS FOR MILLS &c.

CONTRACTORS

FOR HIGH & LOW PRESSURE STEAM HEATING APPARATUS FOR ALL CLASSES OF BUILDINGS.

Send for Illustrated Catalogue.

EATON & COLE.

Manufacturers of

Wrought Iron Pipe Fittings,

Sole Agency for the East.

BRASS VALVES, COCKS, TOOLS, &C.,

58 John Street, NEW YORK.

Sole Agency for the Pacific Coast for

Regester's Patent Gauge Cocks,

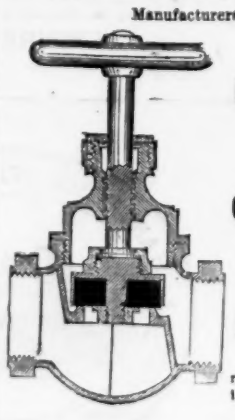
CONROY, O'CONNOR & CO.,

San Francisco, Cal.

Nelson, Finkel & Co.,

439 East 10th St., New York,

Manufacturers of



Jenkins' Patent

Compression Valves

AND

Gauge Cocks

Also,

Nelson's Patent

LUBRICATOR.

Warranted the most reliable and durable in the country.

CAST IRON PIPES

FOR WATER AND GAS.

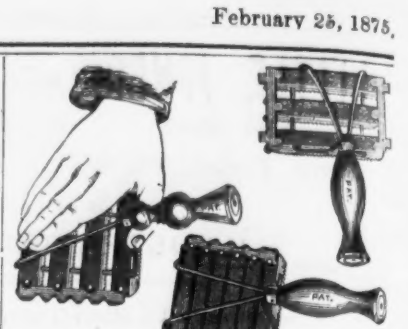
Branches Retorts, &c.

Warren Foundry & Machine Co.,

PHILLIPSBURG NEW JERSEY.

GEORGE BARNES & CO.,

Manufacturers, Syracuse, N. Y.



The Perfect Comb.

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb*. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

WILLIAMS WHITE & CHURCHILL

Successors to

MACKRELL & RICHARDSON MFG. COMPANY

Manufacturers of

Builders' Hardware,

Locks, Hinges, Hooks and Staples,
Awning Hooks, Meat Hooks, Pincers,
Champion Noiseless Pulleys,
CHAIN PULLEYS &c.

Factory, cor. Flushing and Nostrand Avenues BROOKLYN.

Warehouse, 73 Warren St., N. Y.

WM. S. CARR & CO.

Sole Manufacturers of

Carr's Patent Plumbers' Goods

Pumps, Water Closets, Fountains, Vases, &c.

OFFICE AND WAREROOMS

106, 108 & 110 Centre Street,

Factory, Mott Haven, New York.

J. AUSTIN & CO.,

168 Fulton Street, N. Y.,

Proprietors and Manufacturers of

WHEATCROFT'S SELF-ADJUSTING

Pipe Wrench,

AND

Scripture's Funnel Top MACHINE OILERS.

Dealers in

STEAM AND GAS FITTERS TOOLS.

DRILLS,

Pipe Tongs,
Pipe Cutters,
Pipe Threaders,
Flue Brushes.

M. D. CONVERSE & CO.,

68 Park Place, N. Y.

Chapman Valve Mfg. Co.,

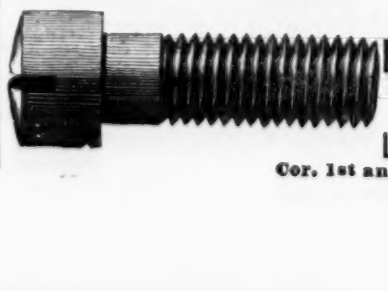
STEAM VALVES,

Iron and Composition, of all sizes.

WATER and GAS Gates, 3 to 48 inches

HYDRANTS.

Office and Warehouse, 75 & 77 Kilby St., Boston, Mass



TURNED MACHINE SCREWS,

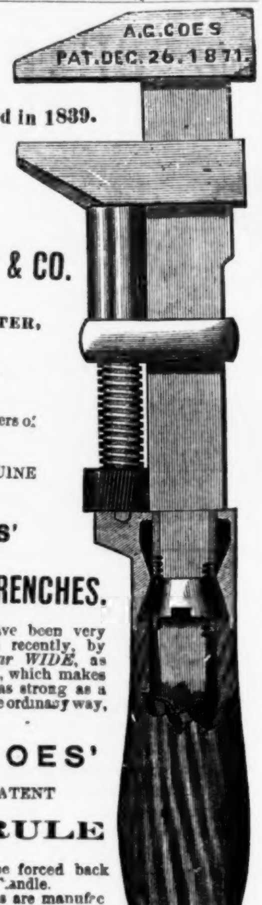
One-sixteenth to five-eighths diameter.
Heads and points to sample.
IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

The Iron Age Directory

and index to Advertisements.



Established in 1839.

A. G. COES & CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE,* as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the Handle.

☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

A. HALL & SONS, Perth Amboy, N. J.
ESTABLISHED 1846.
HALL & SONS, Buffalo, N. Y.
ESTABLISHED 1866.
FIRE BRICK
of reliable quality for all purposes, manufactured of the best New Jersey Fire Clays. Also, ROCKINGHAM WARE, YELLOW WARE, Fire Clay, Fire Sand, Kaolin Ground Fire Brick, and Dinantine Building Brick.

Fire Brick.

B. KREISCHER & SON.,
New York Fire Brick &
STATEN ISLAND
CLAY RETORT WORKS,
Established 1845.
Office, 58 Goerck Street, cor. Delancy Street
East River, New York.

The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.
Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

Watson Fire Brick Manufactory
ESTABLISHED 1836.
JOHN R. WATSON Perth Amboy New Jersey
Manufacturer of
FIRE BRICK,
For Rolling Mills, Blast Furnaces, Foundries Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.
FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE

PEEKSKILL FIRE BRICK WORKS.
Established 1831.
HORTON & MABIE,
Manufacturers of
Fire Brick of all kinds,
STOVE AND RANGE LININGS
of every description. **Linings for Cupola or Foundry Furnaces, Blocks, Tiles, McKenzie Cupola Brick, &c.**
FIRE CLAYS, FIRE SAND & FIRE CEMENT.

Salamander & Albany Fire Brick Works,
Rathbone St., bet. Saratoga R. R. and Erie Canal, Near N. Ferry St., **Albany, New York.**
NEWTON & COMPANY,
(Successors to Palmer, Newton & Co.,) Manufacturers and Wholesale Dealers in **FIRE BRICK** of every variety and shape, Stove, Range and Heater Linings, Portable Clay Furnaces, Fire Clay, Fire Sand, Mica, Kaolin, &c.
HORACE B. NEWTON. JOHN M. NEWTON

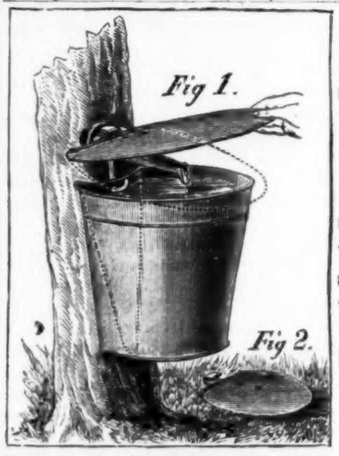
BLACK LEAD
CRUCIBLES.
Manufactured by
ADAM NEWKUMET,
1537 & 1539 N. Front St., Phila., Pa.,
For Steel, Brass, Nickel, Copper, Bronze, &c.
Equal to any in the market, and all guaranteed.
☞ Keeping a full stock of all sizes on hand, and being confident of giving *entire satisfaction* we respectfully ask consumers to give us a trial.

Philadelphia Fire Brick
AND
Clay Retort Works,
AND KENSINGTON FIRE BRICK WORKS
Office, 23d and Vine, Philadelphia.
PHILIP NEWKUMET,
Successors to **JOHN NEWKUMET, Proprietor**
manufactures 9-inch Fire Bricks Tiles, and Blocks, for Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Glass Houses, &c., &c.
Articles of every description made to order at short notice, and in a very superior manner.
"CLAY RETORTS FOR SUGAR HOUSES."

Brick Presses,

BRICK PRESSES,
For Fire and Red Brick.
PATENT STEAM GEARING
For grinding Clay for Red or Fire Brick, and all kinds of **Brick Machines** in general.
Works, 1819 Germantown Ave., Phila.
GEO. CARNELL.

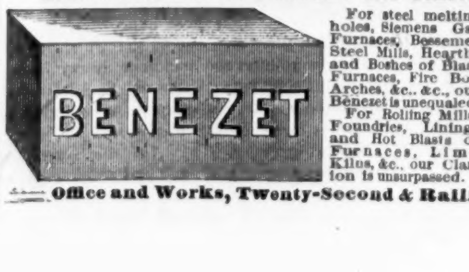
Oldest and Largest Establishment of the kind in the U. S
F. L. & D. R. CARNELL,
1844 Germantown Avenue, Philadelphia.
Manufacturers of Pennsylvania Brick Machine Little Giant Pipe Machine, Fire and Red Brick Presses, Clay Wheels, Tile Machines, Stampers, Grinding Pans. Brick Yards fitted out for running by steam or horse. Heavy and Light Castings. Send for circular.



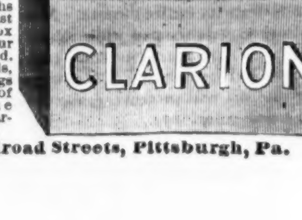
Agents Wanted, Post's Patent Sugar Fixtures. Descriptive Circulars with Samples of EUREKA SAP SPOUTS, and price list, sent postpaid for 20 cents. Address, C. C. POST Burlington, Vt.

Eureka Sap Spout, with Indented Conical Sap Bucket and Cover attached.

STAR FIRE BRICK WORKS.
HARBISON & WALKER,
Manufacturers of Benezet and Clarion Brands of FIRE BRICK.



For steel melting holes, Siemens Gas Furnaces, Bessemer Steel Mills, Hearths and Boshes of Blast Furnaces, Fire Box Arches, &c., &c., our Benezet is unequaled. For Rolling Mills, Foundries, Linings and Hot Blasts of Furnaces, Lime Kilns, &c., our Clarion is unsurpassed.



Office and Works, Twenty-Second & Railroad Streets, Pittsburgh, Pa.

Some Interesting Iron Items.

We have received from Mr. J. L. Lewis, of Pittsburgh, successor to Lewis & Rossiter, No. 10 of the interesting series of pamphlets published by him under the title of Miscellaneous Rolling Mill Information, from which we make the following extracts:

In Hardening and Tempering Cast Steel, an English publication call this the golden rule:

"Hammer to a polish,
Harden at a blood red,
Temper to a straw color."

John A. Roebling's Sons, of Trenton, N. J., have one of the most modern, and in every respect perfect, wire making establishments in the world. Their 8 inch wire trains run at five hundred revolutions per minute. The house has more than a national reputation, and well maintains it. Theirs is said to be the largest wire manufactory in the world.

Bay State Iron Works, of Boston, have a simple method of flattening plate iron. A heavy roller, operated by machinery, rolls over the plate that has been brought opposite to it. The roller is propelled by a rack and pinion; after moving over the plate it is reversed and rolls back to its original position. An old plate roll with the coupling ends and part of the journal turned off, forms the roller weight.

William Clark & Co., of the Solar Hoop Mill, this city, have lately been making hoop iron 4 inch by No. 20 wire gauge. These have been rolled on an 8 inch train—a very great surprise to even practical mill men. The iron was run the usual length of hoop iron, had very perfect edges and beautiful surface. The finishing pass was given to the iron in the Lauth three high differential rolls, the first successful application of the differential rolls, we believe, to this purpose.

More new Devices and Methods in Iron Making are presented for the consideration of the iron world than was ever known before during any period of twenty years in its history. The fact of a new method seeming to work well for a period of one year, or even more, does not demonstrate its entire success. Most iron men of long experience and wide observation can certify to this; questions that cannot be answered by the operation of a new method for a few months, will present themselves after more extended experience.

Graff Bennett & Co., of this city, have in constant operation at their Millvale Works, five of the Danks' puddling furnaces, and we believe contemplate putting in as many more; in connection with these, is used a universal mill, consisting of the usual horizontal and vertical rolls; these are driven by a pair of vertical engines that run at forty revolutions per minute, and which, during the rolling of the ten hundred pound blooms, are reversed in less time than one revolution of the rolls; the rolling of these immense pieces requires only the active employment of an engineer and one person to operate the screws for the top roll. The credit of the arrangement is due to Mr. John I. Williams, superintendent of the works.

Perry & Sons, of the Highfield Engineering and Iron Foundry Works, near Bliston, South Staffordshire, England, had occasion to use some plates that were required to be 35 feet 5 inches in length, by 18 inches in width and three-quarter inches in thickness, and about twenty firms were applied to in England and Scotland, but only one of which quoted a price, which it seems was not satisfactory to the applicants. The firm then made application to a Belgian house, who received the order at £6 per ton under the price quoted by the only firm in England at all prepared to do the work. The iron was made and delivered at the place of the customer in England, and in every way satisfactory and perfect, and created no little excitement among the iron masters when they arrived.

The French Society of Civil Engineers had read before them a paper in high praise of American mechanics and methods. The energy and perseverance exhibited by the American iron trade in overcoming disadvantages is highly spoken of. The dearness of its labor was the one cause given of its inability to compete with foreign products. The Fritz Blooming Mill was mentioned with high appreciation, and it was stated that Mr. Fred Krupp had bought the right to Mr. Fritz's patents for rolling heavy shapes. With these improvements it is stated that three men can do the work of over thirty in rolling and handling heavy irons. Every little while we hear of American improvements in iron making being adopted in the older iron working countries.

Dilworth, Porter & Co., of this city, are manufacturing a new and patented railroad spike. The spike is somewhat hollowed out at the back. This hollow, however, does not extend wholly to the head of the spike, but immediately back of the spike head through where it would be most liable to break, the usual amount of iron is left, so that when the spike is driven, that which remains above the wood is square, and only the back of that which is in the wood is fluted; the object is to produce a spike equal in all the requirements to those that they have always made—the common hook-head spike—yet which will weigh lighter. These hollow-back spikes run some 38 spikes to the keg in number more than the ordinary ones. The firm have facilities for manufacturing from 30 to 40 tons per day.

Milton Iron Co., Northumberland county, Pa., is one of the modern built rolling mills that have been put up in this State within the past three years, and owing to good management, has been a success from the outset. It was designed and erected by W. R. and J. Jenkins, father and son. The following is given as the cost per ton in making bar iron during October and November, 1873:

Cost of pig per ton of muck bar			$36 00
" coal "	fin'd iron		7 00
" fix "	"		75
" labor "	"		14 00
Percentage of waste			1 82
Brick, oil, &c			50
Other incidentals			1 00
Total cost			$51 07

Interest on the investment not included in the above.

What is Steel?—Mr. Ralph Crooker, of Boston, and well known throughout the New England States as a rolling mill man, asks and answers the above question in a neat circular, thus:

Steel.—A combination or an alloy of iron, that will forge, harden, and temper. There are various kinds of steel—such as Carbon Cast Steel, Tungsten Cast Steel, Chrome Cast Steel, Cyanogen Cast Steel, and Titanium Cast Steel; and several other metals have been alloyed with iron to make steel. There is also Blistered Steel, which is made from malleable bar iron, by a process called cementation; German Steel, which is made directly from the ore, and sometimes from pig iron, in the Catalan forge; and steel which is made by other processes. The line between cast iron and steel is—when it is capable of being forged, it is steel; and when it will not forge, it is cast iron. And the line between malleable iron and steel is—when it will harden and temper, it is steel; and when it will not harden and temper, it is malleable iron. Cast steel will harden slightly when it contains from 0·25 per cent to 0·30 per cent. of carbon, and ceases to be capable of forging if it contains much more than 1·75 per cent. of carbon.

Sand Rolls Properly Made, and adapted to the purpose for which they are to be used, will excel in durability to the extent of hundreds of tons in working, others that may be made of excellent fine iron. In other words, the full value of a roll is only had when its metal has been selected with a view to its after use.

Russia Sheet Iron is a name indiscriminately applied by Tom, Dick and Harry to any planished or fine surfaced sheet iron, the manufacture of which may be attempted. We believe that at any one time within the last half century from one to a dozen persons could be found in the United States carrying around samples of smooth surfaced sheet iron, which they proposed to manufacture almost as cheap as dirt, and which was to be the "simplest thing imaginable" to make. Patents have been taken out, capital invested, and rights sold in nearly every iron working State in the Union, and after all, W. D. Wood & Co., of McKeesport, Pa., and Allen, Wood & Co., of Conshohocken, Pa., are, we believe, the only parties who make a Russian-American iron. These have been engaged in manufacturing it for over a quarter of a century; their planished sheet iron is even more handsome than the Russian, whilst the quality is asserted as being equal. The care exercised in making this iron is so different from that taken with the ordinary sheet iron, as to be a matter of wonder to all who have seen it. When ready for market it is delivered in coverings of matting.

Covering Steam Pipes.—A simple, cheap and efficient protection for steam pipes may be prepared as follows: One hundred pounds of clay are mixed with water, and 100 pounds of fine ashes added and well kneaded, then mixed with one pound of hair. This mixture is well incorporated and allowed to stand until needed to use. Just before using, 100 pounds of ground plaster of Paris are mixed with it. The mixture, of course, soon sets, and cannot be kept over 12 hours after the plaster is added.

New York Wholesale Prices, February 24, 1875.

HARDWARE.

Anvils.
Solid Cast Steel ... ℘ ℔ 14c
Wright's ... ℘ ℔ gold 11½c; over 250 ℔s 12c, gold
Armitage's Mouse Hole ... gold 11c
Wilkinson's ... ℘ ℔ gold 11c
Eagle Anvils ... ℘ ℔ 8c
Apple Parers.
Domestic, Turn Table, Lightning, Hudson's, Reading, Union } $7 @ 9 ℘ doz
Skeleton Paring, Coring and Slicing ...
Turn Table, old style ... $6 75 dis 10 %
Bay State, Paring, Coring and Slicing ... $15 00 dis 10 %
Climax Slicer ... 8 00
Augers and Bits.
Douglass, Ives, Beecher (French, Swift & Co), Griswold, Noble } 1st quality..dis 40 @ 40&10 %
Challenge ... dis 40&10 %
Snell Mfg. Co ... dis 22½ @ 25 %
Russell Jennings ... dis 10 %
Lewis' Single Twist Bits ... dis 30 %
Andrews' Bits ... dis 25 %
Cook's Bits ... dis 40&10&10 %
" Augers ... dis 50 %
Expansive Bits, Clark's ... $18 @ $26—dis 15 %
" " Ives' ... $20 @ $30—dis 30 %
" " Blake's ... $20—dis 25&10&10 %
Hollow Augers, Douglass' ... dis 25&10 %
" " Ives' ... dis 25&10 %
" " French, Swift & Co ... dis 25&10 %
" " Bonney's Adjustable. ℘ doz $48—dis 25 %
" " Stearns' " ℘ doz $48—dis 25 %
" " Ives' Expansive ... each $4 50—dis 40 %
" " Cushman's Expansive ... dis 20 %
Gimlet Bits—Screw, $7 50; no screw, $9 ... dis 20&10 %
Double Cut Gimlet Bits, Shepardson's ... dis 20 %
" " Hartwell's ... dis 50 %
" " Douglass' ... dis 20&10 %
" " Ives' ... dis 25 %
" " Ladd's ... dis 50&10 %
Griswold's Patent ... dis 20 %
Morse's Bit Stock Drills ... dis 20 %
L'Hommedieu's Ship Augers ... dis 15 %
Watrous Ship Augers ... dis 15 %
Vaughan's Post Hole— 6 in. $23 60; 9 in. $25 per doz ... dis 20 %
Awls and Tools.
Aiken's ... dis 25 %
Nos. 42 and 43 ... dis 35&10 %
Clark's ... dis 30&10 %
Stanley's Excelsior ... $18 50—dis 20&10 %
Axes.
Brook's ... per doz $12 00 @ 14 00 net
Blood's ... per doz $12 00 @ 13 00
Hunt's ... ℘ doz $12 50 @ 14 00
Collins' ... ℘ doz 11 00 @ 15 50 net @ dis 5 %
H. Clark's (J. C. W. & Co.) Bronzed ... ℘ doz $10 00 net
Hurd's ... ℘ doz 11 50 @ 12 50
Simmons' ... ℘ doz 11 00 @ 11 50
Morris' ... ℘ doz 12 50 @ 13 50
Red Jacket ... ℘ doz 12 00 @ 12 50
Mann's ... ℘ doz 11 50 @ 13 00
" Double Bitted ... ℘ doz 21 50 @ 22 00
Underhill's ... ℘ doz 12 00 @ 13 00
" Crown ... ℘ doz 12 50 @ 13 50
John Leverett's ... ℘ doz 12 50 @ 15 50
Ten Eyck ... ℘ doz $11 00 @ 12 50 net
Balances ... dis 40 %
Bands.
Plated ... new list dis 50&5 %
Iron Rim ... new list dis 25&5 %
Brass (Plated list) ... new list dis 50, 10&5 %
Oroide ... new list dis 50&5 %
Bells.
Hand, Light Brass ... dis 70&5 %
Extra Heavy ... dis 40&10 %
White Metal ... dis 50&10 %
Silver Chime ... dis 15&10 %
Swiss ... dis 25 %
Globe ... dis 15&10 %
Gong, Abbe's ... dis 15&10 %
Yankee ... dis 30&10 %
Barton's ... dis 33⅓ %
Crank, Taylor's ... dis 25 %
Brook's ... dis 50 %
Cone's ... dis 10 %
Connel's ... dis 50&10 %
Lever, Sargent's ... dis 50&10&10 %
Taylor's ... dis 25 %
Hart, Bliven & Mead Mfg. Co ... dis 50&10 %
Pull, " " " " ... dis 50&10 %
Brook's ... dis 50 %
Western ... dis 25 %
Cow—Common Wrought ... dis 20&10 %
Western ... dis 20&10 %
" Sargent's ... dis 50&10&10 %
Kentucky "Star" ... dis 20&10 %
" Sargent's ... dis 50&10&10 %
Dodge's Genuine Kentucky ... dis 35 %
Yaw's Genuine ... dis 30 %
Texas ... dis 35 %
Gall ... dis 15 %
Bellows.
Blacksmiths' ... dis 20 %
Moulders' ... dis 15 %
Hand Bellows ... dis 10 %
Blind Adjusters.—Domestic ... ℘ doz $3—dis 20 %
Blind Fasteners.
Mackrell's ... dis 30 %
Van Sand's, No. 2000, $14 00; No. 3705, $10 75 ... net
Washburn's Patent ... ℘ gross 14 00
Merriman's ... new list net
Blind Staples.
Boardman's Patent, ½ in. and larger ... ℘ ℔ 37 c
" ⅜ in ... " 42 c
Blocks.
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list ... dis 30 %
Burr's ... dis 10 %
Stanley Rule and Level Co ... dis 25&10 %
Bolts.
Cast Iron Barrel, Shutter, &c ... dis 60&10 %
Cast Iron Chain ... dis 60&10&10 %
Wrought Iron Barrel ... dis 50, 10&10 %
" " Square ... dis 50, 10&10 %
" " Shutter ... dis 60&10 %
Wrought Iron Flush, Stanley's ... dis 15&10 %
" " " Sargent's ... dis 50&10&10 %
Carriage and Tire, Common ... dis 75&10&5 %
" " " Norway Iron ... dis 50&10 %
Star, Philadelphia ... dis 50 @ 50&10 %
Eagle Philadelphia ... dis 50 @ 50&10 %
Carriage and Tire, R. B. & W ... old list dis 60 %
Plow, R B & W ... dis 30 %
Stove, R B & W ... dis 20 %
" Shelton Co, Shaved Heads ... dis 20 %
Union Nut Co., old list ... dis 60 %
" " Stove ... dis 15 %
" " Machine ... dis 45&10 %
Borax ... 15c. ℘ ℔
Boring Machines.
Kellogg's ... dis 15 %
Snell Mfg. Co., Rice's Patent ... dis 20 %
" " Regular ... dis 20 %
Douglas Mfg. Co ... dis 20&10 %
Morticing Machines each ... $18 00
Bow Pins.
Union Nut Co ... new list dis 50&10&5 %
Hotchkiss' ... dis 50 @ 55 %
Humason, Beckley & Co.'s ... dis 50&10&5 %
Sargent & Co.'s ... dis 50&10&10 %
Braces.
Barber's Patent ... dis 40&5 %
Q. S. Backus ... dis 40&10 %
Wilson Mfg. Co ... dis 10 %
Spofford's Patent ... dis 50&10 %
Noble's Patent ... dis 40&5 %
Ives' Novelty ... dis 40&10 %
" Hamden ... dis 15&10 %
Common Ball ... dis 15&10 %
Brackets.—Shelf ... dis 60&10 @ 65&10 %
Bright Wire Goods ... dis 65&10&10 %
Bull Rings.—Union Nut Co., new list, dis 50&10&5 %
Sargent's ... dis 60&10 %
Bung Hole Borers.
Common and Ring ... dis 25 %
Ives' Tap Borers ... dis 10&10 @ 25 %
Enterprise Mfg. Co ... dis 20 %
Butchers' Cleavers.
Humason & Beckley Mfg. Co ... dis 20&10 %
Bradley's ... dis 25 %
Beatty's ... dis 20 %

2	3	4	5	6	7	8	9
$19 00	$21 50	$24 00	$27 00	$30 00	$33 50	$36 50	$40 00

Hart Mfg. Co ... dis 45&10 %

0	1	2	3	4	5	6
$25 25	$29 75	$34 25	$38 75	$43 25	$48 50	$54 00

Butts.
Wrought Brass ... dis 30 %
Cast Brass ... dis 20 %
Cast Fast Joint, Narrow ... dis 40 @ 50 %
" " Broad ... dis 50&10 %
Cast Loose Joint, Narrow ... dis 55&10 %
" " Broad ... dis 60&10 %
" " Mayer ... dis 50 %
" " Parliament ... dis 50 %
Drilled Wire Jointed—
Fast Joint, Narrow, High List ... dis 50&10 %
" Broad ... dis 50&10 %
Loose Joint, Narrow and Broad ... dis 60&10 %
Loose Pin ... dis 55 @ 60 %
Wrought Fast Joint, Narrow ... dis 35&10 %
Wrought Broad ... dis 35&10 %
" Loose Joint ... dis 35&10 %
Wrought Table and Back Flaps ... dis 35&10 %
Blind Butts, Parker ... dis 55&10 %
" Palmer ... dis 30&10 %
" Seymour ... dis 55&10 %
" Shepard ... dis 50&5 %
" Lull & Porter ... dis 60 %
" Nicholson ... dis 40&10 %
" Huffer ... dis 33⅓&10 %
" Garretson, No. 1 ... dis 50&10 %
" " Nos. 2 and 7 ... dis 50&5 %
" Clark's, Nos. 1, 3 and 5 ... dis 55&10 %
" " No. 2 ... dis 60&10 %
" " Nos. 2, 4, 4½, 6, 8, 10 ... dis 40 %
The American Spiral Spring Butt Co ... dis 20 %
Standard ... dis 50&5 %
Caps—Percussion, per 1000.
G. D ... 37 @ 40c
Ely's E. B ... 1-4s, 55c.; 1-10s, 65c., gold
" Double Waterproof, 1-4s, $1 43; 1-10s, $1 82½c., gold
Colt's ... 1-10s 80c gold

Carpet Sweepers.
Union ... each $2 75 net
Welcome ... each 2 75 net
Cartridges.—Metallic ... dis 50&10 %
Cards.—Horse and Curry ... dis 30&10 %
Cotton ... dis 10&10 %
Wool ... dis 15&10 %
Carpet Stretchers.
P. S. & W ... per doz $2 00; dis 40&5 %
Sargent's ... per doz $2 88—dis 50&10&10 %
Casters.
Bed ... dis 30&10 %
Plate and Shallow Socket ... dis 40&10 %
Deep Socket ... dis 33⅓ %
Cattle Leaders ... new list dis 60&10 %
Chain
English Coil ... net

℔	.12¾	9½	8¼	7¾	7½	7¼c
	3-16	¼	5-16	⅜	7-16	½

Trace, 6½-10-2 ... by the cask, ℘ pair, gold 57c
Trace, 7-10-2 ... by the cask, ℘ pair gold 62c
German Halter Chain ... dis 25 %
German Coil ... dis 25 %
Galvanized Pump Chain ... ℘ ℔ 13c
Jack Chain, Iron ... dis 50 %
" Brass ... dis 40 %
Chalk.
White ... ℘ gross, 57c net
Red ... ℘ gross, 90c net
Blue ... ℘ gross, $1 00 net
White Crayons ... ℘ gross, 16½c net
Chisels.
Socket Framing, Douglass ... dis 60&10 %
" " Crossman ... dis 50&15&10 %
" " Hart Mfg. Co ... dis 60&10 %
" " Merrill ... dis 60&10 %
" Firmers, Douglass ... dis 50&10&10 %
" " Crossman ... dis 50&15&10 %
" " Hart Mfg. Co ... dis 60&5 %
" " Merrill ... dis 60 %
Socket Corner ... dis 60&10 %
Tanged Firmers ... dis 40&10 @ 50 %
Butcher's ... $5 50 to £ gold
Newbould's ... $5 50 to £ gold
Spear & Jackson's ... $5 50 to £ gold
Clamps.
Cabinet ... dis 60&10 %
Judd's ... dis 45&10 %
Lambert's ... dis 20 %
Providence Tool Co ... dis 10 %
Clips, Axle.
Norway or Best ... dis 30 %
Superior ... dis 50 %
"Star," Superior Philadelphia ... dis 45&5 %
Coal Shovels.
Iron Handled ... ℘ doz, $ 85 @ 1 25
Wooden Handled ... ℘ doz, 1 00 @ 2 00
Coal Hods.—Smith, Burns & Co ... dis 15 @ 25 %

	14	15	16	17	18 inch.
Japanned	$6 00	6 35	6 75	7 50	8 00 per doz.
Galvanized	9 50	10 00	10 75	11 50	12 50 "

Morning Glory Funnel Hods—

No.	15	16	17
Japanned	$9 00	10 50	12 00 per doz
Galvanized	13 00	14 50	16 00 "

Sidney Shepard & Co.'s new list ... dis 10 %
Cockeyes ... 1¼ in., 29c.; 1½ in., 32c.; 1¾ in., 35c. net
Cocks.
Brass Racking ... dis 25 %
Lock and Globe ... dis 25 %
Lever Bibbs ... dis 25 %
Coffee Mills.
Board and Box ... dis 15 %
Increase Wilson's ... dis 15 %
Selsor's Pat ... $9 50, $10 50—dis 25 %
American (Enterprise Mfg. Co.) ... dis 20 %
French Steel ... dis 15 %
The Swift ... dis 25 %
Compasses and Dividers.
Bemis & Call Co.'s ... dis 35&10 %
Cook's ... dis 15 %
Excelsior ... dis 30 %
Peck Stow & Wilcox ... dis 25 %
Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Chas. E. Little ... dis 20 @ 25 %
Swan & Brombacher ... dis 15 @ 20 %
Corkscrews ... dis 25 %
Corn Knives and Cutters.
Bradley's ... dis 10 %
Crow Bars.
Cast Steel ... ℘ ℔ 11c. net
Iron, steel points ... ℘ ℔ 6c
Crucibles.—Gautier & Co ... ℘ No. 5½c
Curling Irons, &c.
½, ⅝, ¾ in., $1 80, $2 00, $2 40 ... dis 10 %
Curling Tongs ... ℘ doz $6 50—dis 15 %
Pinching Irons ... ℘ doz 7 50—dis 20 %
Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass ... dis 20&10 %
Fitch's (List of No. 240, $1) ... dis 20&10 %
Rubber ... ℘ doz, $9 00—dis 15 %
Lawrence Curry Comb Co ... new list, Jan., 1875, dis 25 %
Curtain Pins.—Silvered Glass ... old list dis 52½ %
Cutlery.
American Table { Meriden } New list Jan. '75, dis 25 %
American Pocket { Cutlery Co } dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co ... dis 20&10 %
Dippers.
Britannia ... per doz 7 50—dis 30 %; by bbl. dis 33⅓ %
Cocoa, Plain ... per doz $3 25—dis 20 %
" Rimmed ... per doz 3 75—dis 20 %
Dog Collars.
Embossed Gilt ... dis 20 %
Leather ... dis 20 %
Brass ... dis 25 %
Door Springs.
Gray's ... $7 50 ℘ doz—dis 50&10 %
Torrey's Patent ... $7 50 ℘ doz—dis 55 %
Johnson's ... per doz $3 00 @ 4 00
Palmer's Japanned No. 6 ... ℘ doz $5 00 }
" Coppered " ... " 6 00 } dis 20 %
" Silvered " ... " 8 00 }
Challenge.— Japanned ... ℘ doz $4 00 @ 6 25—dis 40 %
Gem.—No. 1 large, Japanned ... per doz $4 00 }
No. 2 medium ... per doz 3 50 } dis 10 %
No. 3 small ... per doz 3 00 }
Barker's Concealed ... dis 12½ %
Drawing Knives.
Crossman's No. 1 ... dis 50&5&10 %
Douglass ... dis 60&10 %
Hart Mfg. Co., No. 1 ... dis 60 %
Merrill ... dis 60&10 %
Bradley's ... dis 25 %
Adjustable Handle ... dis 15 %
Drills.
Blacksmiths' ... each $2 60 net
Breast, P. S. & W ... dis 15&10 %
" Miller's Falls ... dis 25 %
" Aiken's ... $2 50; 4 00, dis 40 %
" Hotchkiss' ... dis 10 %
Ratchet, Merrill's ... dis 20 %
" Ingersoll's ... dis 25 %
" Whitney's ... dis 20 %
" Moore's Triple Action ... dis 20 %
Drill Chucks.—The Danbury ... each 10 00, dis 20 %
Beach Patent (Morse) ... dis 15 %
Egg Beaters.
Monroe's ... 8 in. 10 in. Per doz $8 00 9 00 ... dis 10 %
Dover ... ℘ doz net $6 00
National ... ℘ doz $4 50—dis 20 %
Peerless ... ℘ doz $4 00—dis 10 %
Emery.
Genuine Chester—Regular Nos ... ℘ ℔ 7c } dis 10 %
" Flour and FF ... ℘ ℔ 4c }
Washington Mills—Regular Nos ... ℘ ℔ 8c
" Flour ... ℘ ℔ 5c
Enameled and Tinned Ware.
Kettles ... dis 30 %
Sauce Pans ... dis 25 %
Glue Kettles ... dis 20 %
Tinned Saucepans ... dis 25 %
Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60&10 %
Wood ... dis 25 %
Faucets.
Fenn's ... dis 50 %
" Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 15&10 %
Taylor's Pattern " ... dis 20&10 %
Wood and Metallic ... dis 40 %
Wood, Cork Lined ... dis 60&10 %
Enterprise Mfg. Co., Self-Measuring ... dis 20 %
Felloe Plates ... ℘ ℔ 14c; dis 10 %
Files.
American File Co ... $5 00 to £ currency—dis 10 %
Nicholson ... new list, Jan. 1, 1875, net
Hartford File Co ... $5 50 to £ currency—dis 10 %
"Western" ... 5 00 to £ net
Rothery's ... $5 to £ currency
J. & Riley Carr ... 5 25 to £ gold
" " Horse Rasps ... 5 50 to £ gold
Stubs' ... 8 50 @ 9 00 to £ gold
Butcher's ... 5 25 to £ gold
Walter Spencer & Co.'s "Diamond" ... 5 25 to £ gold
Spear & Jackson's ... 5 00 to £ gold
Jowitt's ... 5 25 to £ gold
Newbould's ... 5 25 to £ gold
W. K. & C. Peace's "Imperial" ... 5 25 to £ gold
R. Ibbotson ... 5 00 to £ gold
Fisher's ... 4 75 to £ gold
Goodlad's ... 4 00 to £ gold
Moss & Gamble ... 5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 5 00 to £ gold
" " Horse Rasps ... 5 25 to £ gold
"Philo Sheffield," P. T. Co ... 5 00 to £ gold
Limet & Co. (French) ... 4 50 @ 5 00 to £ gold
Fluting Machines.
Mrs. Coles' ... 5 in., $6 00; 7 in., $7 00
" " Pony..4 in., $4 75; 5 in., $5 6 in., 5 50; 7 in., $6
Knox, with 4-inch Rolls ... 5 75 each }
" " 6 " " ... 7 00 each } dis 20 %
" " 8 " " ... 9 00 each }
O. K ... 6 50 each net
Peerless, 4-inch Rolls ... 4 00 each net
" 5 " " ... 4 75 each net
Excelsior, No. 1 ... 4 75 each net
" No. 2 ... 6 50 each net
Diamond ... 7 50 each net
Climax 7-inch Rolls ... 8 00 each net
" 4½ " ... 6 50 each net
Empire ... 4 00 each net
Eureka, No. 1, 7-inch Roll ... 8 00 each net
" No. 2, 5-inch Roll ... 6 00 each net
K. F. M., 4½-inch Roll ... 5 50 each dis 15 %
" 6-inch Roll ... 6 00 each dis 15 %
Myers' Fashion Fluter, 4½ inch Rolls ... 3 00 each net
" Convex Brass Fluter, Sad Iron attachment..$1 75
Domestic Fluter ... $1 75 each net
Fairy, Self-Heater ... 00 each net

Geneva Hand Fluter ... $15 00 per doz net
Champion, 6 inch rolls ... $6 00 each dis 10 %
" 4 inch rolls ... $5 00 each dis 10 %
Fluting Scissors ... dis 25&10 %
Forges.
"Empire" (W. P. Kellogg & Co.) ... dis 30 %
Forks.
Hay, Manure & Spading ... dis 30 %
Plated A 1 ... dis 50 %
Fry Pans.
Burnished, P. S. & W., new list ... dis 45 %

℘ doz	$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No	0	1	2	3	4	5	6	7	8

Smith, Burns & Co., "Excelsior" Polished ... dis 35 %

℘ doz	$3 70	4 00	4 70	5 30	6 00	7 00	8 00	9 00
No	1	2	3		5	6	7	8

Gas Stoves.
Tifft & Howard ... dis 20 %
Gauges.
Marking ... dis 45&10 %
Wire ... dis 10 %
Gimlets.
Nail and Spike ... dis 25&10 %
Double Cut, Shepardson's ... dis 20 %
" " Ives' ... dis 25 %
" " Douglass' ... dis 20&10 %
Grind Stone Fixtures
Sargent's Patent ... dis 65&10 %
Reading Hardware Co ... dis 66⅔&7½ %
Hart Mfg. Co.'s ... dis 60&5&10 %
Hammers.
Emmet Hammer Co.'s Handled ... dis 25 %
" " Sledge & Stone ... ℘ ℔ 25 @ 30c net
Humason & Beckley Mfg. Co ... dis 16⅔&10 %
Maydole's, new list ... dis 5 @ 7 %
Cheney's ... new list net
Verree ... dis 5 %
Yerks & Plumb ... dis 12½ %
Magnetic Tack ... dis 20&10 %
Warner's ... list net
Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair } dis 25 %
" Leg Irons $5 50 per pair }
Providence Tool Co.'s Hand Cuffs $15 per doz } dis 10 %
" " Leg Irons 25 " }
Handles.
Wrought Chest ... dis 60&10 %
Surface Chest ... dis 65&10&10 %
Flush Chest ... dis 60&10&10 %
Lifting ... dis 60&10 %
Coffin ... dis 50&10 @ 60&10 %
Saw and Plane ... dis 20&10 %
Hammer and Hatchet ... dis 10 %
Greensboro', Axe, Pick, Hammer, &c ... dis 10 %
North Carolina Handle Co ... dis 10 %
Woolworth Axe, Pick and Sledge ... dis 10 %
Brad Awl ... per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 20&10 %
" " " large " 6 50—dis 20&10 %
Apple " " ass'td " 6 00—dis 20&10 %
" " " large " 7 50—dis 20&10 %
Socket " " ass'td " 3 50—dis 20&10 %
" Framing " " 7 00—dis 20&10 %
File ... " 4 00—dis 20&10 %
" ... " 6 50—dis 20&10 %
Auger ... large " 8 00—dis 20&10 %
Patent Auger, Ives' ... dis 25&10 %
" " Douglass' ... per set $1 25—dis 10 %
" " Swan's ... per set $1 00—dis 10&10 %
Hangers.
Barn Door ... dis 65&10 %
"Anti-Friction" (Rider, Wooster & Co.) ... dis 30 %
Novelty ... dis 30 %
Harness Snaps.
Henshaw's ... dis 25&10 %
Judd's ... dis 40 %
Fitch's (Bristol) ... dis 30 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 25 %
Sargent's ... dis 50&10 %
New York Wire ... dis 20&20 %
Hatchets.—Isaiah Blood ... dis 10 %

	Nos.				
Shingling,	Nos. 1 2 3	℘ doz	$7 50	8 00	8 50
Claw,	" 1 2 3	℘ doz	8 50	9 00	9 50
Lathing,	" 1 2 3	℘ doz	7 50	8 00	8 50

Hunt's ... dis 10 %

Shingling,	Nos. 1 2 3	℘ doz	$7 25	8 00	8 75
Claw,	" 1 2 3	℘ doz	7 75	8 50	9 25
Lathing,	" 1 2 3	℘ doz	7 50	8 25	9 00

Hurd's ... dis 25 %

Shingling,	Nos. 1 2 3	℘ doz	$8 00	8 50	9 00
Claw,	" 1 2 3	℘ doz	9 00	9 50	10 00
Lathing,	" 1 2 3	℘ doz	8 00	8 50	9 00

Newark's Edge Tool Co.'s ... dis 25 %

Shingling,	Nos. 1 2 3	℘ doz	$6 50	7 00	7 50
Claw,	" 1 2 3	℘ doz	7 25	7 75	8 25
Lathing,	" 1 2 3	℘ doz	6 50	7 00	7 50

Yerkes & Plumb ... dis 12½ %

Shingling,	Nos. 1 2 3	℘ doz	$7 00	7 50	8 00
Claw,	" 1 2 3	℘ doz	7 50	8 00	8 50
Lathing,	" 1 2 3	℘ doz	7 00	7 50	8 00

Simmon's ... dis 15 %

Shingling,	Nos. 0 1 2 3	℘ doz	$7 50	8 00	8 50	9 00
Claw,	" 1 2 3	℘ doz		9 00	9 50	10 00
Lathing,	" 1 2 3	℘ doz		8 00	8 50	9 00
Broad,	" 1 2 3	℘ doz		9 00	10 00	12 00
"	" 4 5 6	℘ doz		14 00	16 00	18 00
"	" 7 8	℘ doz		20 00	22 00	

Elephant ... dis 25 %

Shingling,	Nos. 1 2 3	℘ doz	$8 00	8 50	9 00
Claw,	" 1 2 3	℘ doz	9 00	9 50	10 00
Lathing,	" 1 2 3	℘ doz	8 00	8 50	9 00

J. P. Verree & Co ... dis 5 %

Shingling,	Nos. 1 2 3	℘ doz	$7 00	7 50	8 00
Claw,	" 1 2 3	℘ doz	7 50	8 00	8 50
Lathing,	" 1 2 3	℘ doz	7 00	7 50	8 00

Underhill's ... dis 10 %

Shingling,	Nos. 1 2 3	℘ doz	7 25	8 00	8 75
Claw,	" 1 2 3	℘ doz	7 75	8 50	9 25
Lathing,	" 1 2 3	℘ doz	12 00	11 00	13 00

Hinges.
Gate, Western ... ℘ doz $6 25—dis 60&10 %
" N. E ... ℘ doz 11 25—dis 60&10&10 %
" N. Y. State ... ℘ doz 7 20—dis 60&10 %
Rolled Plate ... dis 65&10 %
" Raised ... dis 65&10 %
Wrought Strap and T ... dis 40&10 @ 50 %
Providence Plate. { 6 and 8 in. 11c ℘ ℔; over 8 in. 9½c ℘ ℔ } ... dis 25 @ 30 %
Screw Hook and Strap ... { 8, 10, 12 in. 7c; 14 to 36 in. 6c } ... net
Heavy Welded Hook ... { 8 to 12 in. 6½c; 14 in & up, 6c } ... net
Screw Hook and Eye ... { ¾ to 1 in., 8½; ⅝ in. 9½; ½ in. 11½ } ... net
Screw Hook and Eye, Sargent's— ⅜ ½ ¾ inch.
Per doz pairs $4 75 7 25 10 25—dis 65&10&10 %
Hoes.
Solid Shank, C. S ... ℘ doz $8 00—dis 30 %
Socket ... ℘ doz 9 00—dis 30 %
Riveted Eye ... ℘ doz 5 00—dis 30 %
Grub ... dis 25 %
Planters ... net @ 10 %
Scovill ... add 33⅓ %
Scovill Pattern ... net @ 5 %
Lane's C. S. Cresent, American Pattern ... add 5 %
" " " Scovill Pattern ... add 15 %
Hooks.
Bird Cage ... dis 60&10 @ 70&10 %
Cotton ... dis 50 %
Belt ... dis 50&10 %
Bench—Skinner's ... per doz $8 00, dis 30&10 %
Bench—Hotchkiss' $5 00 ℘ doz ... dis 10 %
Bench—Weston's No. 1, $8 00; No. 2, $7 00 per doz net
" —McGill's ... $3 00 per doz, dis 10 %
Clothes Line, Harness, Wardrobe, Hat and Coat, Ceiling } Hart's list ... dis 60&10&10 %; Sargent's list ... dis 60&5&10 %; Reading list ... dis 33⅓&10 %
Wrought Staples and Hooks and Staples ... dis 70&10 %
Wire Screw Hooks and Eyes ... dis 65&10&10 %
Grass ... dis 20 %
Whiffletree—Patent ... dis 30 %
Hooks and Eyes—Malleable Iron ... dis 60&10&10 %
" " Brass ... dis 60&10&10 %
Horse Nails.
Putnam's.

No.	5	6	7	8	9	10
	32c	28c	26c	25c	24c	23c

In lots 2000 lbs. dis. 5 %.
Ausable Horse Nail Co.

No.	5	6	7	8	9	10
Ausable	30c	27c	25c	24c	23c	22c
Pointed and Polished	31c	28c	26c	25c	24c	23c
Pointed and Blued	32c	29c	27c	26c	25c	24c

In lots of 1000 lbs., 5% discount.
Brundage.

No.	5	6	7	8	9	10
	29c	26c	24c	23c	22c	21c

In lots of 500 lbs., dis. 5 %.
American Pressed.

No.	5	6	7	8		10
	22c	20c	20c	20c	20c	20c

In lots of 1000 lbs. dis 5 %.
Perkins Finished (ready to drive).

No.	5	6	7	8	9
	31c	28c	26c	25c	24c

In lots of 1000 lbs. dis 5 %.
Buffalo Forged.

No.	6	7	8	9	10
	28c	26c	25c	24c	23c

Globe (Pointed and Polished).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished).

No.	5	6	7	8	9	10
Patent Finish	28	25	23	22	21	20
Extra "	30	27	25	24	23	22

In lots of 1000 lbs., dis 5 %.
Vulcan (Blued, pointed, ready to drive).

No.	5	6	7	8	9	10
	33c	30c	28c	27c	26c	25c

In lots of 500 lbs., 5 % discount.
" 1000 lbs 7½ % discount.
New London Horse Nails.

No.	6	7	8	9	10
Great Western	27c	25c	24c	23c	22c
U B	29c	27c	26c	25c	24c

In lots of 1000 lbs., dis 5 %.
Star Brand ... ℘ ℔ 16c
Morgan ... 14c
Horse Shoes.
Burden ... ℘ keg, $5 85
R. I. Horse Shoe Co., Perkins Pattern ... ℘ keg, 5 85
" " R. I. Pattern ... ℘ keg, 6 35
Mule Shoes ... ℘ keg, 6 85
Kettles.
Brass ... ℘ ℔ 45c net
Enameled ... dis 30 %

Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe " ... dis 15 %
" Bread " ... ℘ doz $1 50—dis 15 %
Hay and Straw, "Wadsworth's" ... dis 20 %
Lothrop's Cocoa Handle Lap Bolster Butcher Knives ... dis 25 %
Knobs.
Carriage ... dis 60&10 %
Base—Common ... net
" Plush Tip ... dis 10 %
" Elastic End, No. 8 ... dis 30&10 %
Door, Mineral ... ℘ doz $2 25 }
" Por. Jap'd ... ℘ doz 3 00 } dis 45&5&2 %
" " Plated ... ℘ doz 7 00 }
" " Por ... ℘ doz 7 50 }
Ladles.
Melting, Hart's ... dis 55&10 %
" Sargent's ... dis 50&10 %
" Reading ... dis 15&10 %
Lanterns.
Tubular ... No. 0, $12 50—dis 15 %
Peerless ... No. 5, per doz $11 75—dis 10&10 %
Brady's Patent ... dis 10 & 10 %
Ætna ... dis 10 & 10 %
Yankee ... dis 10 & 10 %
De Beque ... dis 10 & 10 %
Lard Presses.
Draw Cut, 14 inch ... each $65 00—dis 20 %
Lemon Squeezers.
Porcelain Lined ... per doz $6 30, dis 10 %
Lines.
Linen Fish ... dis 10&10 %
Cotton Chalk ... dis 40 %
Silver Lake Chalk ... dis 10&10 %
Mason's ... dis 10&10 %
Galvanized Wire Clothes ... 60c per 100 ft. net
Locks and Latches.
Cabinet—Gaylord ... dis 25 %
" Eagle ... dis 25 %
Trunk " ... new list dis 25 %
Langstroth & Crane, Round Key ... dis 40 %
" " Flat Key ... dis 33⅓ %
Barnes & Deitz ... dis 25 %
Continental ... dis 15 %
Shepardson's ... dis 20 %
American Lock Co ... dis 33⅓ %
Plate ... dis 25 %
Yale Lock Co ... dis 40 %
Sargent & Greenleaf ... dis 30 %
Trenton, Branford, Norwich, Russell & Erwin, Norwalk, Nashua, Mallory, Wheeler & Co., P. & F. Corbin, Parker & Whipple, Jacobus & Nimick Mfg. Co. } Rev'd list of Jan. '75 dis 45&5 %. 2 % extra for cash.
Padlocks, Russell & Erwin; " Mallory, Wheeler & Co; " Wm. Wilcox & Co } List of Jan., '75. dis 50&5&2
" Romer's ... dis 15 %
" Vulcan Hardware Co ... dis 20 %
" New York Lock Co ... dis 20 %
" J. H. McWilliams ... dis 5 %
" Scandinavian Jail ... dis 10 %
" Barnes & Deitz ... dis 25 %
" D. K. Miller Lock Co ... dis 30 %
Mallets.
Hickory and Lignumvitæ ... dis 20 %
Meat Cutters.
Dixon's (P. S. & W.) ... dis 10 %

No	1	2	3	4
℘ doz	$14 00	$17 00	$19 00	$30 00

Hales' ... dis 25 %

No	11	12	13
℘ doz	$27 00	$33 00	$42 00

Miles Challenge ... dis 30 %

No	1	2	3
℘ doz	$22 00	$30 00	$40 00

Perry's Champion (P. S. & W.) ... dis 10 %

No	200	300	400
℘ doz	$22 00	$27 00	$40 00

Woodruff's (P. S. & W.) ... dis 10 %

No	100	150
℘ doz	$15 00	$18 00

American ... dis 25 @ 25&5 %

No	1	2	2½	3	4	B	5
Each	$6 00	$9 00	$12 00	$15 00	$30 00	$60 00	$75 00

Draw Cut ... dis 20 %

No	5	6	8
Each	$56 00	$90 00	$250 00

Molasses Gates.
Stebbins' ... dis 65&10 %
" Tinned ends ... dis 40&10 %
Bush's ... dis 20 %
Lincoln's ... dis 50 %
Weed's ... dis 15 %
Mortars and Pestles.
Iron ... net
Nails ... See Trade Report
Nuts and Washers.
Nuts ... large, 6c; small, 8c off list.
Washers ... large, 8c; small, 10c off list.
Oilers.
Miller's Zinc, Brass and Copper ... dis 40 %
Sheet Metal Screw, Zinc ... dis 37½ %
" " " Brass ... dis 33⅓ %
Olmsted's ... dis 25&10 %
Broughton's ... dis 25&5 %
Malleable ... per doz $5 00 dis 10 %
Prior's Patent or "Paragon" ... dis 30&10 %
Ox Shoes.
Concave ... ℘ ℔ 13c net
Ox Balls ... dis 60&10 %
Pencils
Faber's Carpenters' ... net
" Round Gilt ... ℘ gross $6 00 net
Dixon's Lead ... ℘ gross $4 50 net
" Lumber ... ℘ gross 9 00 net
Picture Nails and Knobs.
Brass Head ... dis 60&10 %
Porcelain Head ... dis 55&10 %
Richards' Patent ... dis 40 @ 40&10 %
Judd's ... dis 60&10 %
Pinking Irons ... per doz $2 75—dis 45 %
Planes.
First Quality ... dis 35 %
Second Quality ... dis 50 %
Bailey's Patent Adjustable ... dis 20&10 %
Plane Irons, Butcher's ... $5 50 to £ gold—new list
" Auburn Tool Co.'s ... dis 25 %
" Chapin's ... dis 10&10 %
" Greenfield Tool Co ... net list
" Middletown Tool Co ... net list
" Ohio Tool Co ... dis 10 %
" Spear & Jackson's ... 5 50 to £ gold—new list
" Sandusky Tool Co ... dis 10 %
" Bailey's ... dis 20&10 %
Plow Bits, Greenfield Tool Co ... dis 10 %
Pliers and Nippers.
Button's Patent ... dis 33⅓ %
Hull's Patent Nippers ... dis 25 %
Leach's Patent Wire Cutters ... per doz $6 50—dis 15 %
Plumbs and Levels
Chapin's ... dis 66⅔&10 %
Standard Rule Co.'s New Adjustable ... dis 60&10 %
Standard Rule Co.'s Non-Adjustable ... dis 60&10&10 %
Stanley R. & L. Co.'s Pat. Adjustable ... dis 60&10 %
" " " Non-Adjustable ... dis 65&10 %
Pocket Levels ... dis 50&10 %
Johnson's Patent Adjustable ... dis 60&10 %
Pulleys.
Hot House and Tackle ... dis 60&10 %
Jap'd Screw ... dis 60&10 %
Brass Screw ... dis 60&10 %
Jap'd Side ... dis 60&10 %
" Clothes Line ... dis 60&10 %
Hay Fork ... per doz $4 50 @ 5 00, dis 10 %
Pumps.
Douglas Cistern, etc ... new list dis 25 %
" S. & F ... new list dis 20 %
Union Mfg. Co's. Cistern and Pitcher ... dis 25 %
" " " Rams ... dis 20 %
" " " Garden Engines ... dis 10 %
Cucumber (Burlingham & Purdy)—
6 ft. No 3, with 12 ft. pipe ... $4 00 net
6 ft. No. 1, with 12 ft. pipe ... 4 50 net
From 6 to 36 ft. add 20 cents per ft.
Pipe, 8c. per ft.; Coupling, 20c. per ft.
Punches.
Belt or Drive ... per doz $1 50 net
Spring ... per doz $7 00—dis 20&10 %
Rail.
Sliding Door, Wrought Brass ... ℘ ℔ 44c., dis 10 %
" " Iron, Painted ... ℘ foot 9c—dis 55&10 %
Barn Door, ½, ⅝ and ¾ inch ... dis 60&10&10 %
" " for N. E. Hangers ... dis 60&10&10 %
Rakes.
Cast Steel ... dis 30 %

$8 00	9 00	10 00	11 00
8	10	12	14 teeth.

Malleable ... dis 30 %

$5 00	5 50	6 00	6 50
9	11	13	15 teeth.

Razor Straps.
Evan's ... dis 25&10 %
Genuine Emerson (B. F. Badger or C. Emerson) ... dis 25 %
Imitation Emerson ... ℘ doz $2 75—dis 40 %
Hunt's ... dis 40 %
Chapman ... dis 10 @ 15 %
Torrey's ... dis 10&10 %
Saunder's ... net @ 10 %
Rivets.—Old Colony.
Iron and Tinned ... dis 25&7½ %
In bulk ... dis 7½ %
Copper Rivets and Burrs (No. 8, 50c) ... dis 35 %
Rivet Sets ... net
Rods.
Stair ... new list dis 30 %
" American Patent ... dis 33⅓ %
Rollers.
Barn Door ... revised list dis 60, 10&10 %
Novelty ... dis 10 %
Rope. Manufacturers' List of Jan. 7, 1875.
Manila ... ½ inch and larger ℘ ℔ 15 c
" ... ⅜ inch ℘ ℔ 15½c
" ... ¼ and 5-16 inch ℘ ℔ 16 c
Manila Lath Yarn and Tar'd Rope ... ℘ ℔ 14½c
" Hay Rope ... ℘ ℔ 15½c
Sisal ... ½ inch and larger ℘ ℔ 12 c
" ... ⅜ inch ℘ ℔ 12½c
" ... ¼ and 5-16 inch ℘ ℔ 13 c
" Hay Rope ... ℘ ℔ 12½c

Rules.
Chapin's Boxwood ... dis 66⅔&10 %
" Ivory ... dis 50&10 %
Hubbard & Curtiss Mfg. Co ... dis 60&20 %
Stanley Rule and Level Co.'s Ivory ... dis 50&10 %
" " " Boxwood ... dis 70 %
Standard Rule Co.'s Boxwood ... dis 70 %
" " " Ivory ... dis 50&10 %
Sad Irons.
From 4 to 10 lbs ... ℘ ℔ 3¾ @ 4c net
Sad Iron, Nickel Stand attached ... ℘ ℔ 9c
Self-Heating ... per doz $10 00 net
" Tailors' ... per doz 22 25 net
Sand Paper.
Beader & Adamson's (Flint) 00 to 1½..$4 25 ℘ ream }
" " 2, 2½ & 3. 4 75 " }
" " Assorted ... 4 25 " } dis 15 %
" " Star ... ℘ ream $3 25 }
" " Emery ... ℘ ream $6 50 @ 11 50 }
H. B. & M. Roman Flint ... dis 15 %
Sash Cord.
Common ... ℘ ℔ 20 @ 22c. net
Silver Lake, Russia Flax ... ℘ ℔ 55c }
" " White Cotton ... ℘ ℔ 55c } net
" " Drab Cotton ... ℘ ℔ 60c }
Sash Locks.
Clark's, Nos. 1 and 2 ... dis 33⅓ %
Ferguson's ... dis 33⅓ %
Norwich ... dis 15 %
Walker's ... list net
Sash Weights.—Solid Eyes ... ℘ ℔ 2½c
Sausage Stuffers or Fillers.
Miles ... ℘ doz $20—dis 10 %
Stow or Perry ... ℘ doz No. 1, $15; No. 0, $21—dis 15 %
Draw Cut No. 4 ... each $30 00—dis 20 %
Saw Frames ... per gross $18 00—dis 10&10 %
Saw Rods ... $10 list, dis 10&10 %
Saws.
Spear & Jackson's oldpattern ... $4 50 to £ gold
Spear & Jackson's American Pattern ... $3 55 to £ gold
John Spear ... $3 60 to £ gold
Am. Saw Co ... new list
Perforated Cross Cuts, all kinds ... 68c ℘ foot
Inserted Tooth ... dis 10 %
All else ... dis 12½ %
Disston's Circular ... dis 20 %
" Mill ... dis 25 %
" Cross Cut ... dis 15 %
" other kinds ... dis 12½ %
Livingston's Framed Wood ... dis 10 %
Livingston's Butcher and Kitchen ... dis 10 %
H. W. Peace's Circulars ... dis 10 %
Other kinds ... dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular ... new list dis 15 %
Wm. McNeice's Patent Pole Pruning Saw ... dis 10 %
" " " Compass Saw ... net.
E. M. Boynton's Lightning ... dis 40 % for immediate cash
" " Others ... dis 15 %
Wheeler & Clemson Mfg. Co.'s Hand ... dis 15 %
" " " " Cross-Cut ... dis 30 %
Saw Sets.
Stillman's Genuine ... ℘ doz $5 00—dis 10 %
" Imitation ... ℘ doz 3 25—dis 10&10 %
Aiken's Pattern ... ℘ doz 7 00—dis 25&10 %
" Genuine ... ℘ doz $15 00—dis 25 %
Hart's Patent ... dis 15 %
Nash's ... dis 20&10 %
Bemis & Call's ... dis 20 %
Hotchkiss' ... ℘ doz 5 50—dis 10 %
Common Lever ... per doz $2 00—dis 10&10 %
Leach's ... dis 15 %
Scales.
Hatch, Counter ... ℘ doz $36—dis 25 %
" Tea ... ℘ doz $15—dis 25 %
Turnbull's ... dis 20 %
Brown's ... dis 25&5 %
Fairbanks' ... new list dis 15 @ 20 %
Howe's ... dis 15&5 %
Shattuck's Counter and Union ... dis 15 %
Chatillon's Grocers' ... dis 25 %
Eureka ... dis 25 %
Universal Family ... dis 20 %
Scale Beams.
No. 1 300 to 1200 lbs ... 90c ℘ cwt } dis 25&10 %
No. 2 " " ... 75c ℘ cwt }
Scrapers.
Box, 1 Handle ... per doz $6 25, dis 10 %
" 2 " ... per doz 7 50, dis 10 %
Foot ... dis 60 & 10 %
Ship (common) ... per doz $8 00 net
Ship—Providence Tool Co ... dis 10 %
Screws.
American list of Jan. 1, 1874.
Flat Head Iron ... dis 52½ %
Round Head Iron ... dis 50 %
Flat Head Brass ... dis 52½ %
Round Head Brass ... dis 50 %
Round Head Silver Capped ... dis 35 %
Hand Rail ... dis 55&10 %
Coach or Lag ... dis 30&10 @ 40 %
Coach, Patent Gimlet Point, List Jan. 1, 1875 ... dis 35 %
Bed ... list net
Japanned (List of Flat Head Iron) ... dis 40 %
Machine—Flat Head, Iron, List Jan. 12, 1875 ... dis 25 %
" " Brass, " " ... dis 15 %
Round Head, Iron, " " ... dis 20 %
" " Brass, " " ... dis 10 %
English, Flat Head, Iron—
Nettlefold & Chamberlain's ... dis 52½&10&5 %
Birmingham Sc'w Co. (A. Field & Co.) ... dis 52½&10&5 %
Bench—Iron ... dis 60, 10&10 %
" —Wood, Beach ... ℘ doz $3 00 net
" " Hickory ... dis 20&10 %
Hand ... dis 25&10 %
Jack—Bell Bottom ... dis 15 %
Scythes.
Blood's German Steel, Grass ... ℘ doz $9 00
" Cast " " ... ℘ doz 10 00
" Silver " " ... ℘ doz 11 00
" German " Grain ... ℘ doz 13 00
" Cast " " ... ℘ doz 14 00
" Red Rover ... 12 00
" Young America ... 9 50
" Silver Clipper ... 12 63
Scythe Snaths ... dis 20 %
Sieves.—Mann's Patent ... dis 25 %
Shears.
Cast Steel ... dis 70&10 %
Cast Iron ... dis 25&10 %
Seymour's Straight Trimmers ... dis 60&10 %
" Scissors ... dis 45&10 %
Pruning ... per doz $9 00—dis 20&10 %
Sheaves.
Sliding Door ... dis 45&5&2 %
" Patent Roller ... dis 25 %
" " Hatfield's. High list, dis 50 %; low list ... dis 25 %
" Russell's Anti-Friction ... dis 50 %
Sliding Shutter ... dis 50&10&10 %
Shovels and Spades.
Ames ... dis 12½ %
Birmingham Shovel Co ... dis 15 %
Rowland's ... dis 25 %
Old Colony ... new list dis 10&5 %
Middleboro' Shovel Co ... new list dis 12½ %
Dunning's Shovels and Scoops ... dis 20&7½ %
Snow Shovels ... ℘ doz $7 00 @ 8 00 net
Shovels and Tongs.
Iron and Brass Head, R. & E. list ... dis 50 %
" " Hart's ... dis 50&10 %
Polished Steel ... new list dis 50 %
Skates.
Barney & Berry's
N. Y. Club ... ℘ pair $2 75 }
B. & B. Club ... " 3 50 } dis 25 %
All Clamp ... " 4 25 }
Rink ... " 8 00 }
Florence Club ... per pair $3 50—dis 25 %
" Steel ... per doz $9 net
Peck & Snyder's—
American Club, Polished ... ℘ pair $5 00
" " Blued Top ... ℘ pair $3 75 net
Slates.
Square Frames, Round Cornered, by case ... dis 70&10 %
Less than a case ... dis 70 %
Oval Frames, by case ... dis 40 @ 40&10 %
Less than a case ... dis 30 %
Spoke Shaves.
Iron ... dis 33⅓&10 %
Wood ... dis 30 %
Bailey's ... dis 20&10 %
Spoons.
Iron ... dis 10 %
By the case ... dis 20 %
Britannia ... dis 45&10 %
Rogers & Bro., A 1 ... dis 50 %
Derby Silver Co ... dis 50 & 5 %
Holmes, Booth & Haydens ... dis 50 %
Nickel Silver Co ... dis 40 %
German Silver ... dis 30 %
Tinned (P. S. & W.)—
Teas ... $1 50 ℘ gross, net
Tables ... 2 75 " net
Stocks and Dies ... dis 5&10 %
Stone.
Hindostan Stone ... ℘ ℔ 6c }
" Axe Stone ... ℘ ℔ 8c } dis 20&10 %
" Slips ... ℘ ℔ 10c }
Sand Stone ... ℘ ℔ 6c—dis 20&10 %
Washita Stone ... No. 1, ℘ ℔ 22c net
" ... No. 2, ℘ ℔ 17c net
" Slips ... No. 1, ℘ ℔ 45c net
Arkansas Stone ... No. 1, ℘ ℔ $1 25 net
" Slips ... No. 1, ℘ ℔ $2 00 net
Grindstones, Family, J. F. Green & Bro ... dis 20 %
Stove Polish.
Gem ... ℘ gross $5 00, dis 10 %
Joseph Dixon's ... ℘ gross, 6 00
Gold Medal ... ℘ gross $6 00 dis 15 %
Squares.
Steel ... dis 50 %; full cases, dis 50&10 %
Iron ... dis 50 %; full cases, dis 50&10 %
Nickel Plated ... add $2 50 @ $4 00 ℘ doz net
Try Squares and T Bevels ... dis 45&10 %
Star Try Squares and Bevels ... dis 30 %
Disston's Try Squares No. 1 ... dis 20 %
" " No. 2 ... dis 40 %
" " Improved ... dis 20 %
Tacks.
Full Weight American Iron ... dis 45&7½ %
Half Weight American Iron ... dis 72½&7½ %
Carpet ... dis 50&7½ %
Brads American Half Weight ... 1¼ in. and over

	½	⅝	¾	1	1¼ in. and over
Finishing Nails					dis 7½ %
℘ ℔	25c	20c	18c	14c	12c dis 7½ %
Trunk and Clout	½	⅝	¾	1	1¼ in. and over
℘ ℔	25c	20c	18c	14c	12c dis 7½ %

Copper Tacks ... ℘ ℔ 30c—dis 7½ %
Iron Shoe Nails, ℘ ℔ 4-8 and longer, 9½c; 3½-8, 10c ... dis 7½ %
Double Pointed ... dis 33⅓&10 %

Tapes, Measuring.
American Flask and Cap Co.....dis 20 %
Eddy's.....dis 20 %

Tea Trays.
American Tea Tray Co.....dis 15 %

Thermometers.
Tin Case.....dis 50&10 %

Toe Calks.
.....℔ 13c net

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20 %
Morse's.....℔ doz $12·00—dis 10&10 %
Wood Bottom.....per doz $12—dis 25&10 %
All Iron.....per doz $19·50—dis 25&10 %

Tinners' Tools and Machines.
P. S. & W.....list net

Traps.
Newhouse.....dis 20 %
Peck, Stow & Wilcox.....dis 30 %
Blake's Patent.....new list dis 25 %
Mouse, Wood Choker.....℔ doz holes. 15 @ 16c
" Patent Choker (Union Nut Co.).....℔ doz holes 16 @ 18c net
" Round, Wire.....℔ doz $1 50 to 2 00 net
" Square, ".....℔ doz 2 00 to 2 50 net
" Cage, ".....℔ doz 2 50, dis 10 %

Trowels.
Lothrop's Brick and Plastering.....dis 10 %
Disston's Plastering.....dis 12½ %
Disston's Brick.....dis 12½ %
Rose's Brick.....dis 5 %
Brades' Brick.....gold. dis 10 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 25 %

Triers.
Butter and Cheese.....dis 25 %

Ventilators (Window).
Nickel and Gilt.....per dozen $16·00 @ 18 00

Vises.
Trenton Vises, Solid Box.
90 to 160 lbs.....16c
160 and over.....15c
Peter Wright's.....℔ 15½c. gold
Wilson's Solid Box.....dis 15 %
99 to 160 lbs.....18c
160 and upward.....22c
Wilson's Parallel.....dis 30 %
Sargent's ".....dis 50&10&10 %
Backus & Union, Parallel.....dis 25 %
Buffalo, Parallel.....new list dis 25 %
Fisher & Norris' Double Screw Parallel.....dis 15&10 %
Trenton Parallel.....dis 15 %
Merrill's Parallel.....dis 15 %
Parker's.....dis 20 %
Stephens' Parallel.....dis 15 @ 20 %
Bonney's Saw Filers.....per doz $20—dis 25 %
Stearn's Saw Filers.....per doz $20—dis 25 %

Wheel Barrows.
Canal (Pugsley & Chapman).....new list dis 10 %
Coal, Garden and Stone (Pugsley & Chapman).....dis 25

Well Wheels.
Revised list.....dis 60&10 %

Wire.
Brass and Copper.....dis 10 %
Bright and Annealed.....Nos. 0 @ 18 dis 45 @ 47½ %
" " .....19 @ 26 dis 55 @ 57½ %
" " .....27 @ 36 dis 60 @ 62½ %
Coppered.....0 @ 18 dis 40 @ 42½ %
Galvanized, Nos. 0 to 9.....℔ 8½ @ 9c net
Galvanized, Nos. 10 to 18.....market list dis 10 @ 15 %
Tinned.....dis 25 @ 30 %
Cast Steel.....dis 15 @ 20 %
Tinned Broom Wire.....dis 30 @ 35 %
Galvanized Telegraph, Nos. 8 and 9.....℔ 9c @ 9½c
Galvanized Telegraph, Nos. 10 and 11.....℔ 10c @ 10½c
" " 12.....℔ 10½c @ 11c
Annealed Fence, Nos. 8 and 9.....dis 45 @ 50 %
" Grape, " 10 to 14.....dis 45 @ 50 %
Fence Staples.....℔ 7½ @ 8 %
Stubs' Steel Wire.....$7 00 to £ gold
Judd's Picture Wire.....dis 50

Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 20 %
" Diagonal.....dis 20 %
Collins & Co.'s.....dis 45 %
Coes' Genuine.....dis 40&5 %
" Pattern (Wrought).....dis 50&10 %
" " (Malleable).....dis 60&10 %
Lindsay's Patent.....dis 25 %
Taft's Pattern.....dis 70 %
Davis' Patent Duplex.....new list dis 25 %
Bemis & Call's Patent Combination.....dis 20&5 %
" " Merrick's Pattern.....dis 25&2½ %
" " Brigg's Patent.....dis 15&10 %
Aiken's Pocket.....per doz $10·00—dis 40&10 %

Wringers.
Providence.....℔ doz $64 00
Reliance.....℔ doz 61 00
Universal—Extra.....℔ doz 64 00
Novelty.....℔ doz 64 00
Sherman.....℔ doz 64 00
Eureka (Friction).....℔ doz 60 00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 5 %.
COMMON STAMPED WARE, &C.

Bucket Covers.

Quarts	½	1	2	3	4
Inch	4½	5 3-16	6 5-16	6¾	7 11-16
Per gross	$2·00	2·60	3·40	4·25	5·75
Quarts	6	8	10	12	
Inch	8¾	9¼	9¾	10 9-16	
Per gross	$6·50	8·00	8·50	11·50	

Cake Box Covers.

	Small.	Medium.	Large.
Inch	11½	12¾	13½
Per gross	$15·00	18·00	22·00

Pot Covers.

Inch	7¾	8¼	8¾	9¼	9¾	10¼
Per gross	$5·75	6·00	6·25	6·75	7·25	8·25
Inch	10¾	11¼	11¾	12¼	12¾	13¼
Per gross	$8·75	9·50	10·00	13·00	13·75	16·50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4·00	4·50	5·50	[illegible]	8·50	10·50

Deep Pie Plates.

Inch	9	10
Per gross	$8·50	10·50

Jelly Cake Pans.

Inch	9	10
Per gross	$7·50	10·00

Coffee Pot Covers.

Plain	1½	2	3	4	5	6 qts.
Inch	3	3¾	3¾	4½	5	
Per gross	$1·15	1·40	1·60	2·00	2·75	3·00
Rimmed	2¾	3	3½	4	4½ inches.	
Per gross	$2·25	2·50	3·00	3·50	4·00	

T. K. Breasts only.

Inch	7½	8	8½	9	9½	10	10½	11	11½
Per gro.	$6·00	6·50	6·75	7·25	7·75	9·50	10·00	12·00	13·00

Grater Plates.

Sheet	¼	½	1
Per gross	$3·00	6·00	11·50

Scolloped Cake Pans.

	Small.	Large.
Without Tubes.....per gross,	$8·00	11·50
With Tubes	10·50	14·00

Stamped Square Pans.

No.	½	
Per gross	$7·50	14·50

Common Square Pans (One Sheet).
Per gross.....$11·50

Milk Skimmers (Plain or Pierced).
Per gross.....$4·00

Lettered Plates.

Inch	5½	6
Per gross	$3·25	4·00

Steamer Bottoms.
Add $1 per gross, or 10c. per doz. to list of Pot Covers.

Tin Stove Pipe Rings.

Inch	4	4½	5	5½	6	7
Plain.....per gro.	$4·00	4·50	5·00	5·50	6·00	7·00
Jap'd or Burn'd	6·00	6·50	7·00	8·00	8·50	10·00

Coffee Boiler Lips.

	Small.	Large.
To Rivet.....per gross,	$0·80	1·10
To Solder	1·25	

DEEP STAMPED AND RETINNNED WARE, dis 25 %

Plain Stamped Water Dippers.

	½ pint.	Pint.	Quart.	2 quarts.	2½ quarts.
Per doz	·90	1·15	1·50	1·85	2·50

Retinned Milk Pans.

Qts.	½	1	1½	2	3	4	5	6	8	10	12
℔ doz.	1·20	1·50	1·75	2·00	2·25	3·15	3·50	3·85	4·75	5·25	5·75

Dipper Bowls, Plain Stamped—

Pints	½	1	Quarts	1	2	2½
Per doz.	·60	·75	Per doz.	1·00	1·25	1·75

Dipper Bowls, Retinned—

Pints	½	¾	1	Quarts	1	2	2½
Per doz.	·75	·95	1·05	Per doz	1·40	1·75	2·25

Pans.
Dish Pans, Retinned Deep—

Quarts	7	8	10	14	17	21	30
Per doz.	8·50	9·50	11·00	13·00	16·00	19·00	30·00

JAPANNED TIN WARE, dis 5 %.

Canisters, Common.....Pound ½ 1 2 3
Per gross $10·50 15·00 24·00 30·00
Canisters, Hinged.....Pound 1 1½ 2 3 4
Per gross $19·00 25·00 32·00 37·00 42·00
Canisters, Square.....Pound 2 4 6 8 12 16
Per doz $3·00 4·25 5·00 5·75 8·00 9·10
Candlesticks, Japanned.....No. 1 2
Per gross $8·00 7·00
Cake Boxes, Round.....per nest, $5·25
" Square.....per nest, 4·25
Chamber Pails, Japanned
Nos 2 3 4 5
Green, per doz $8·00 9·00 11·00 13·00
Oak " $9·00 11·00 12·00 13·50
Dust Pans, Corrugated.....per gross, $22·00
Box Graters.....per gross, $3·75
Molasses Cups.....Pint ½ 1 2 4
Per gross $13·00 16·00 28 00 42·00
Lunch Boxes, per doz.....7 in $2·00; 8 in. $2 50
Pepper Boxes Japanned.....℔ gross small, $3·00; large, $4·00
Toy Banks, House.....No. 1 2
Per gross $7·00 5·50
Toy Banks, Gothic.....No. 1, $6·00, No. 2, 4·00 per gross
Toy Cups, Straight.....No. 1 2 3
Per gross $3·75 3·25 2·75
Toy Cups, Flaring.....No. 1, $4·35; 2, $3·75 ℔ gross
Toy Pails, Covered.....No. 1, per gross $4·00
Toy Rattles.....per gross, $2·00
Trunks, Wire Handled.....per nest (5) $1·75
Spittoons, Tin.....per gross, $27

PLANISHED TIN WARE, dis 25 @ 30 %.

Planished Coffee Pots, Round.

Each	·60	·75	·85	·95	1·15	1·25	1·30	1·40
Pints	1	2	3	4	5	6	7	8

Planished Tea Pots, Round.

Each	·70	·80	·95	1·05	1·25
Pints	2	3	4	5	6

Planished Tea Pots, Oval.

Each	·70	·80	·90	1·05	1·15	1·40	1·75
Pints	1	2	3	4	5	6	8

Planished Pepper Boxes, No. 1.....per doz., $1·52
Planished Flour Dredges, No. 3, $2·10; 4, 2·45 ℔ dozen.

Planished Round Coffee Biggins.

Pints	2	3	4	5	6	8
Each	$1·00	1·10	1·20	1·40	1·60	2·00

Planished Oval Coffee Biggins.

Pints	2	3	4	5	6	8
Each	$1·15	1·25	1·40	1·60	1·80	2·25

Planished Oval Chafing Dishes, Imperial Covers.

Inch	10	12	14	16	18	20	22	24
Each	$3·85	5·00	6·25	7·00	9·00	11·50	15·00	16·50

Planished Oval Chafing Dishes, Low Covers.

Inch	10	12	14	16	18	20
Each	$3·25	4·35	5·20	6·20	7·80	9·25

Planished Low Dish Covers.

Inch	10	11	12	14	16	18	20
Each	$·70	·80	1·00	1·25	1·50	2·00	2·75

Planished Imperial Dish Covers.

Inch	10	11	12	14	16	18	20	22	24
Each	$1·55	1·70	2·30	2·30	2·15	3·45	4·00	5·45	6·80

Planished Etnas, on Stands.

Pints	1½		3	4	5
Each	$0·90	1·00	1·20	1·50	1·75

Planished Liquor Mixers.....Nos. 0 1 2
Per doz $2·00 2·10 2·45

Planished Oval Melon Molds.

Nos	2	3	4	5	6	7	8	9
Each	$·60	·65	·70	·80	·90	1·00	1·15	1·35

Planished Oval Tumbler Warmers.
To fit 1, 2, 3, and 4 O. G. Urns.....each, $2·50

Planished Oval O. G. Urns.

Nos	0	1	2	3	4	5	6	7	8
Each	$4·90	5·45	6·30	7·00	7·75	9·25	11·25	12·50	15·50

Planished Round Urns.

Nos	0	1	2	3	4	5	6	7
Each	$4·20	4·85	5·45	6·30	7·25	9·00	11·00	14·25

Planished Round Oyster Dishes, (Complete)..Nos. 1 2
Each $2·10 2·80
Planished Oyster Dish Plates.....Nos. 1 2
Each $0·25 0·30
Oyster Dish Covers.....Nos. 1 2
Each $0·30 0·35

Tea Pot Handles—P. S. & W.....dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small 4½ inches.....per gross, $11·50
No. 2, Medium, 5¾ ".....12·50
No. 3, Large, 6½ ".....13·50
No. 4, Ex. Large 7¼ in., for Wash Pitchers &c.....18·00
Solid Iron, Tin Tipped.
No. 10, Small, 4¾ inches.....per gross, $9·00
No. 15, Medium, 5½ ".....9·50
No. 20, Large, 6½ ".....10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W.
No. 12, Bronzed and Tin-Tipped.....per gross, $13·50
Saucepan Handles. Of Best Malleable Iron.
P. S. & W.....dis 20 %
Japanned.
No. 1, 5½ inches long.....per gross, $3·50
No. 2, 6 ".....3·75
No. 3, 6½ ".....4·00
No. 4, 7¼ ".....4·25
No. 5, 8 ".....4·50
No. 6, 9 ".....4·75
Tinned.
No. 1, 5½ inches long.....per gross, $4·25
No. 2, 6 ".....4·50
No. 3, 6½ ".....4·75
No. 4, 7¼ ".....5·25
No. 5, 8 ".....5·50
No. 6, 9 ".....5·75
Japanned.....per lb., ·16
Tinned.....·20
Iron Kettle Ears (P., S. & W.).....dis 45 %
Half gross pairs in a package.
Tinned.
Nos.....1 2 3 4 5 6 7
Per gross pairs..88c $1·00 1·50 1·75 2·10 2·75 3·75 4·50
Black.
Nos.....1 2 3 4 5 6 7 8
Per gross pairs...75c 88c $1·35 1·50 1·75 2·25 2·75 4·00
Tinned Tea Kettle Ears.
Nos.....4 5 6
Per gross pairs.....$1·75 2·10 2·75
Extra Heavy Tinned Kettle Ears—French Pattern.
Nos.....1 2 3 4 5 6 7
Per gross pairs.....1 00 1·25 1·50 1·75 2·00 2·50 3·00
Malleable Iron Kettle Ears for Coal Hods, &c.
P., S. & W.....dis 20 %
No. 10 Small.....℔ ℔. Tinned 22c; black, 16c
No. 20 Medium.....℔ ℔, " 20c; " 16c
No. 30 Large.....℔ ℔, " 20c; " 16c
No. 40 Extra Large.....℔ ℔, " 20c; " 16c
In cases of 100 lbs. each.
Milk Can or Boiler Handles—(P. S. & W.) 4½ in..dis 25 %
Plain, 8c.; Jap'd, 9c.; Tinned, 15c. per lb.; Malleable Clips or Ears to match, Tinned.....30c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.).....dis 35 %
Plain with drilled holes, per lb.....9c
Plain with Cast ".....8c
Plumbers' Scrapers—(P., S. & W.).....dis 25 %
Extra quality, length 6 in., per doz.....$4·00

METALS.

IRON.—Duty Bars, 1 to 1½ cents per lb.. Sheet, Band, Hoop and Scroll, 1½ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1¼ cents per lb.

Pig Iron—AMERICAN.
Foundry No. 1.....℔ ton, $28 00 @ 30 00
Foundry No. 2.....26 00 @ 28 00
Gray Forge.....24 00 @ 28 00
White and Mottled.....
SCOTCH.
Coltness.....38 00 @ 39 00
Glengarnock.....
Eglinton.....34 00

Bar Iron.
Am. Refined, at mill.....nominal.....

Rails.
Welsh, gold.....℔ ton,
American, at works, currency.....48 00 @ 53 00
Old Rails.....27 00 @ 28 00

Scrap.
Wrought Scrap.....34 00 @ 35 00

Bar Iron from Store.
Common Iron.
¾ to 2 in. round and square / 1 to 6 in. x ⅜ to 1 in.....℔ ton $60 00 @ 62 50
Refined Iron.
¾ to 2 in. round and square / 1 to 6 in. x ⅜ to 1 in.....62 50 @ 65 00
1 to 6 in. x ¼ and 5-16.....67 50 @ 70 00
Shafting Iron—3¼ to 4 in.....75 00 @ 90 00
Rods—3-16 to ⅝ round and square.....67 50 @ 110 00
Bands.....80 00 @ 82 50
Hoops—⅝ to 2 in.....90 00 @ 135 00
Swedish Iron.
Ordinary sizes.....130 00 @ 132 50
Plow size.....145 00 @ 150 00

Sheet Iron.

	Common American and English.	R. G. American.	R. G. English.
Nos. 10 to 20 ℔ ℔	4¼	5¼c	5¼c
21 to 24	4½ @ 4¾c	5⅜c	5⅜c
25 to 26	4¾c	5⅜c	5⅝c
27	5c	5⅞c	6c
28	5¼c	5¾c	6¼c

Galvanized, 1 to 20, prime, ℔ ℔ 9; 2d quality.....℔ ℔ 8c
" 21 to 24 " " 10 " " 9c
" 25 to 26 " " 11 " " 10c
" 27 " " 12 " " 11c
" 28 " " 13 " " 12c
Patent Polished.....℔ 15c
Russia, Nos. 8 to 16.....17½c
" Stained, No. 1.....16½c
Belgian.....10c
One piece Corrugated Sheet Iron Elbows.
CHARCOAL IRON.
⅝ 5 5½ 6 7 inch.
$2·50 3·50 4·50 5·25 6·50 per doz.
RUSSIA IRON.
4½ 5 5½ 6 7 inch.
$5·00 7·00 9·50 12·00 14·00 per doz.

COPPER—Duty. Pig, Bar and Ingot, 5c.; old copper, 4 cents ℔ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem. All subject to a reduction of 10 per cent.
American Ingot.....℔ ℔ 22 @ 22½c
English ".....

SHEATHING, BRAZIERS' COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot.....35c ℔ ℔
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.....35c. "
Braziers' Copper, 12 oz. per square foot and lighter.....39c. "
Circles less than 84 inch in diameter.....35c ℔ ℔
Circles, 84 inch diameter and over.....39c. "
Segment and Pattern Sheets.....35c. "
Locomotive Fire Box Sheets.....38c. "
Sheathing Copper, over 12 oz. per sq. ft.....31c. "
" 12 oz. ℔ sq. ft. and lighter.....39c. "
Bolt Copper.....35c. "
Copper Bottoms, 32 c. ℔ ℔.....net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier.....36c. By the case, c. ℔ ℔
12 oz. and lighter.....39c. " " 38c "
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier.....36c. By the case, 37c. ℔ ℔
(And all sizes not over 20 inches wide.)
30x60
14 and 16 oz. and heavier.....40c. ℔ ℔
12 oz.....43c. "

TINNING.
14x48, by the case.....8c. ℔ sheet
14x48, less than case.....10c. "
Boiler Sizes, 7 and 8 inch.....12c. "
" 9 inch.....15c. "
Other sizes not larger than 30x60.....2½c. ℔ sq.
Larger than 30x60.....5c. "

LEAD—Duty Pig $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.
Spanish.....6¾ @ 7c gold
German Refined.....6½ @ 6¾c gold
English.....6¾c. gold
American.....6½ @ 6¾c gold
Bar.....dis 10 %.....8½c.
Pipe.....dis 10 %.....9c.
Tin Lined Pipe.....dis 10 %.....16½c.
Sheet.....dis 10 %.....9½c.
Shot.....dis 10 %. Drop, 10c. Buck, 11c.

BABBITT METAL.
S. P. U.....℔ ℔ 8½ @ 9c
A, 25c.; B, 20c.; C, 15c.; D, 12c., ℔ ℔.

SOLDER.....No. 1, 15c; No. 2, 13½ @ 14c

STEEL—Duty: Bars, ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb. over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, whatever form or description shall be classed as

American Cast Steel.
Tool.....15 @ 16c
Spring.....10c
Homogeneous.....12½c
Tire.....12½ @ 13½c
Machinery (round and square).....10 @ 11c
File.....11c
Sheet.....14 @ 16c
Saw Plate, mill and mulay.....14 @ 16½c
Saw Plate, gang and X cut.....13 @ 14c
" circular as to size.....18 @ 30c

Chrome Steel.
Tool.....℔ ℔ 20 @ 21c
Tool, extra fine....." 40 @ 75c
Spring.....℔ ℔ 12c and upward
Machinery.....℔ ℔ 14c
Hammer....." 15c,
Gun or Homogeneous....." 16c

English Steel.—payable in gold, dis 5 % cash.
" Best Cast.....℔ ℔ 18c
" Extra Cast....." 19c
" Round Machinery, Cast....." 11½c
" Swaged, Cast....." 18c
" Best Double Shear....." 18c
" Blister, 1st quality....." 13½c
" " 2d quality....." 11½c
" " 3d quality....." 10½c
German Steel, Best....." 11½c
do 2d quality....." 10½c
Sheet Cast Steel, 1st quality....." 18c
" " 2d quality....." 16c
" " 3d quality....." 14c
File Steel, Flat and ½ Round....." 12½c
" Square and Round....." 13c
" Mill....." 13½c
" Taper to 4 inch....." 17c
" Taper 3 and 3½ inch....." 18c

SPELTER—Duty: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.
Silesian, cash.....6¾ @ 7c, gold
American ".....6¾ @ 11c., currency

TIN—Duty: Plates, Sheets, Tagger and Terne, 1·1c. per lb.; Electro-galvanized Plates, 2 cents per ℔; Manufactures of, not enumerated, 35 per cent. ad val.—all subject to a reduction of 10 per cent. Bars, Blocks and Pigs, free. Banca, subject to duty of 10 per cent.
Banca.....℔ ℔ 25 @ 26c., gold
Straits.....℔ ℔ 22 @ 25½c, gold
English.....℔ ℔ 21½ @ 22c., gold

CHARCOAL TIN PLATE.
I C 10x14, Prime Charcoal.....11·50 @ 11·75
12x12, ".....12·00
14x20, ".....12·25
I X 10x14, ".....13·75
12x12, ".....14·25
14x20, ".....14·75
D C 12½x17 ".....11·00
D X 12½x17 ".....13·25
For each additional X add.....2·25

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$10·25 @ 10·75	9·50 @ 10·00	9·25 @ 9·75
I C 12x12	10·50 @ 10·75	10·00	9·25 @ 9·50
I C 14x20	10·50 @ 11·00	10·50	9·25 @ 9·50

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$10·50	9·50 @ 10·00	8·50 @ 9·25
I X 14x20	12·75		
I C 20x28	21·00 @ 21·50	19·50 @ 20·00	17·00 @ 18·50
I X 20x28	26·00		
I C 20x200	24·00		

ZINC.—Duty: Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ℔ ℔. All subject to a reduction of 10 per cent.
Sheet.....cask 10½c
".....open 10¾c

Old Metals.

(Dealers' Selling Prices.)
Copper.....@ 20
Yellow metal.....14 @ 15
Brass.....13 @ 14
Heavy Composition.....17 @ 18
Old lead, solid.....6 @ 6¼
Tea lead.....5
Wrought iron.....1½ @ 1¾
Sheet iron.....0¾ @
Cast iron.....1 @ 1¼
Machinery iron.....1¼ @
Zinc.....5 @ 5½
Pewter, No. 1.....17
" No. 2.....10 @ 12
Spelter.....5½ @ 6

Paints, Oils, etc.

Paints.
Black, lamp—Coach Painters.....℔ ℔ [illegible]
" " Ordinary.....6c
" Ivory Drop, fair.....15c
" " best.....30c
Black Paint, in oil.....kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best.....50 @ 75c
" " in oil.....35 @ 65c
" Chinese, dry.....83c
" Ultramarine.....25 @ 30c
Brown, Spanish.....1¼c
" Van Dyke.....9c
Carmine, 40.....$12 00
Green, Chrome.....15 @ 23c
" in oil.....18 @ 25c
" Paris.....good, 30c: best, 40c
" in oil....." 30c " 45c
Mineral Paints.....1¼ @ 4c
Orange Mineral.....14½c
Red Lead, American.....9½c
" English.....10½c
" Venetian (N. C.) dry.....2¼c
" in oil.....asst'd cans, 11c; kegs, 8½c
" Indian, dry.....10c
Rose Pink.....13c
Sienna, American, Raw.....4c
" Burnt.....4½c
" in oil.....16 @ 20c
" Raw
" in oil.....15 @ 25c
Umber, Burnt.....4 @ 8c
" " in oil.....16 @ 21c
" Raw.....3¼ @ 7¼c
" in oil.....16 @ 22c
Vermillion, Chinese.....
" English.....1 9½ gold
" Trieste.....1 65 "
" American, Common.....25c
White Lead, American, pure dry.....10c
" in oil.....11c
White, Paris, English, prime.....in bbls. 2¼ @ 2½c
Yellow Ochre, French.....2¼ @ 2½c
" " in oil.....asst'd cans, 11c; kegs, 8½c
" " Vermont.....in casks 1¼c
" Chrome.....17 @ 27c
" in oil.....18 @ 28c
Zinc White, American No. 1 dry.....9c
" 1, in oil.....11c
" French (Paris).....11 c
" in oil.....12 c

Oils.
Linseed Raw.....℔ gal. casks, 79c. bbl 80c
" Boiled....." 81c. " 85c
Whale, Crude.....
" Bleached Winter.....
Sperm, Crude....." 1·60
" Winter unbleached....." 1·85
" Bleached....." 1·90
Seal, Extra Refined.....
Lard, Pure Winter....." 1·18
" Spring....." 1·10
Cotton Seed, Crude....." 60c
" Southern Yellow....." 65c
" White.....
Neatsfoot, Winter.....70c @ $1·10
Natural Lubricating.....38c @ 40c

Sundries.
Asphaltum.....9c
Benzine.....℔ gal. 16c
Chalk.....1¼c
" Block.....
Dryer, Patent, Am'n.....asst'd cans, 10½c.; kegs 9c
" " English....." 11c.; " 9c
Flocks.....
Frostings.....50c
Glue, White.....38 @ 47c
" Sheet.....30c
Glaziers' Points, Zinc.....9c
Gum, Copal.....36c
" Damar.....35c
" Shellac, English.....85c
" " dark.....75c
Litharge.....10c
Pumice Stone, selected Lumps.....4 @ 6c
" powdered.....4c
Putty in bladders.....3½c
" in bulk.....3c
Rotten Stone, soft, English.....8c
Spirits Turpentine.....28c
Whiting, Spanish.....1c

Glass.
French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	
6 x 8 to 10 x 15	$10·25	$9·25	$8·75	$8·00
11 x 14 to 16 x 24	12·00	11·00	10·00	9·50
18 x 22 to 20 x 30	15·00	13·50	12·00	10·50
15 x 36 to 24 x 30	17·50	15·25	13·50	
26 x 28 to 24 x 36	18·25	16·00	13·25	
26 x 36 to 26 x 44	20·00	18·00	14·50	
26 x 46 to 30 x 50	21·00	19·00	15·25	
30 x 52 to 30 x 54	22·50	20·25	16·25	
30 x 56 to 34 x 56	24·50	21·75	19·00	
34 x 58 to 34 x 60	26·00	24·50	21·50	
36 x 60 to 40 x 60	30·50	27·00	24·50	

DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$16·50	$15·00	$14·00	$12·00
11 x 14 to 16 x 24	19·25	17·75	16·00	15·25
18 x 22 to 20 x 30	24·00	21·75	19·25	
15 x 36 to 24 x 30	28·00	24·50	20·00	
26 x 28 to 24 x 36	29·25	25·75	21·25	
26 x 36 to 26 x 44	32·00	29·00	23·25	
26 x 46 to 30 x 50	33·75	30·50	24·50	
30 x 52 to 30 x 54	36·00	32·50	26·00	
30 x 56 to 34 x 56	39·25	35·00	30·50	
34 x 58 to 34 x 60	41·75	39·25	34·25	
36 x 60 to 40 x 60	49·00	43·25	39·25	

Sizes above—$12·00 per box extra for every 5 inches. An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 84 united inches will be charged in the 84 united inches bracket.
Discount 60 & 10 to 60 & 15 %.

Grindstones, Emery, &c.

Walter R. Wood,
GRINDSTONES.

SOLE AGENT OF THE
BEREA STONE CO., of Ohio.
NOVA SCOTIA and other brands.
283 & 285 Front Street, New York.

Grindstones.

AMHERST,
INDEPENDENCE,
LAKE HURON,
AND BEREA.

Also Scythe Stones.
WORTHINGTON & SONS, Mfrs.,
North Amherst, Ohio.

OIL STONE.
BOYD & CHASE,
107th Street and 1st Avenue, N. Y.,
The largest manufacturers in the world of
Arkansas Washita Oil Stone.
Also, *Hindostan, Sand* and *other Stone.*
Send for circular.

EMERY WHEELS AND MACHINERY
Upon which to run the same, of all kinds.
EMERY Emery Cloth, Mill Stone CEMENT. TRADE MARK DIAMOND Tools, Oil Stones,
Soapstone Register Borders.
For particulars, address,
UNION STONE CO.,
6 Exchange and 26 Devonshire Streets, Boston, Mass.

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Emery Wheel Co.,
Weissport, Penn.
Manufacturers of
"LEHIGH" Emery Wheels and Machines.
Send for Circulars.

ROCKY MOUNTAIN VERMILION PAINT CO.
Trade Mark.

THE
Rocky Mountain Vermilion Paint
is "Nature's Compound" of Copper, Mercury, Lead and Iron. A pure Oxide of Metals, containing no earthy matter, hence we claim and are prepared to *prove* that it is the Best and Cheapest Paint in the market. Properly mixed, we will guarantee it to cover double the surface and wear twice as long as ordinary paints. It will not Peel, Scale, Crack or Blister, though subjected to high degrees of heat. It will effectually Prevent the Corrosion of Metals, even in mid ocean. Warranted superior to red lead or any other lead, for any and all purposes for which paint is required. Please send for circulars.
All orders should be addressed, **Wm. H. Corey,** General Agent, 20 Sabin St., Providence, R. I.

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NO CHIMNEY KEROSENE LAMP
WITHOUT SMOKE OR SMELL.
Light equal to gas. Adapted to Dwellings, Churches, Factories or Public Buildings. Breakage of one chimney per week will pay for Lamp in one year. Every Lamp guaranteed for one year. Liberal discounts to trade.
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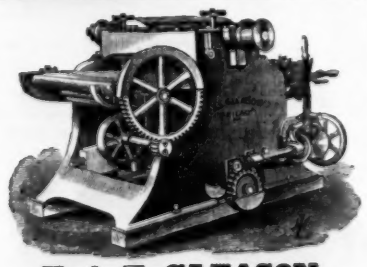

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IMPROVED WOOD TOOLS.
27 Haydock St., Philadelphia.

L. COES'

Genuine Improved Patent

SCREW WRENCHES.

Manufactured by

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Established in 1839.

Registered March 23, 1874.

We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to *any* strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

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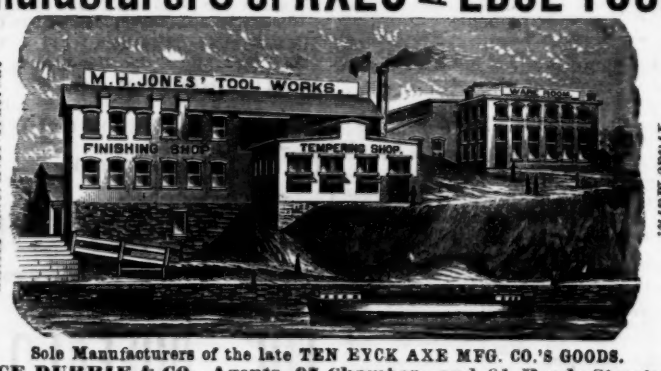

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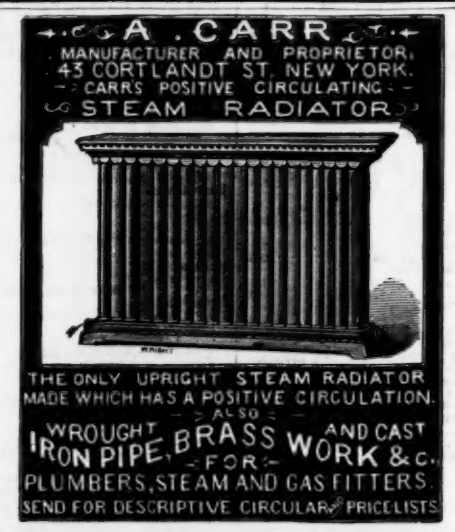

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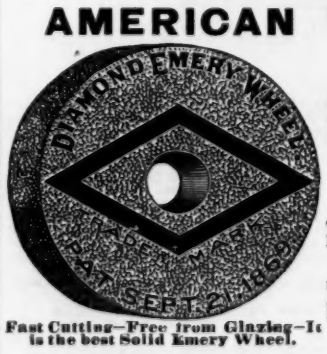

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From twelve (12) to forty-eight (48) inches swing;
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Of Superior Quality made to order.

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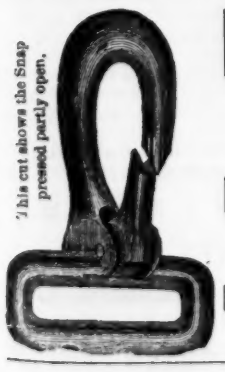

This cut shows the Snap pressed partly open.

Middletown Tool Co.,

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Greatly Improved in Style and Pattern.

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BUTCHERS' STEELS,
AND
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CORPORATE TRADE MARK. FOUR PEPPERCORNS AND A DIAMOND.

GRANTED A.D. 1766, BY THE CORPORATION OF CUTLERS OF SHEFFIELD, AND PROTECTED BY ACT OF PARLIAMENT.

THE TRADE MARK, IN ADDITION TO THE NAME,
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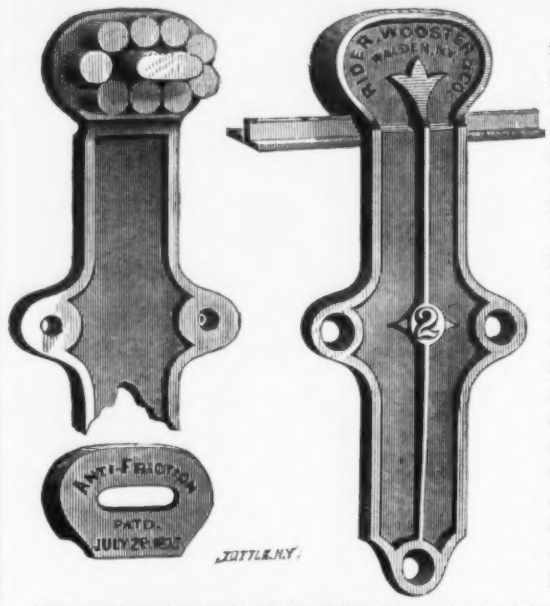
Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

Anti-Friction Barn Door Hanger



This Hanger is entirely new in principle and design, and possesses marked advantages over all others, entirely obviating all the defects and annoyances hitherto experienced in the use of ordinary sheaved hangers.

In construction it is exceedingly simple, as will be seen by the cut. The weight of the door is supported by a strong stud, between which and the rail is a series of chilled iron rollers, inclosed by the front of the hanger and cap, and as these rollers pass under the stud, they are returned over it in succession. There is consequently no friction, except that of rolling surfaces Its leading advantages are:

GREAT DECREASE OF FRICTION, moving (as determined by direct experiment) with **one-fourth the power required by any other Hanger in the world.**
Great Strength. Unlimited Durability.
No Axles and Sheaves to grind and break.
All bearing surfaces harder than steel.
Thorough protection from the weather.
It will not clog with snow and ice.
It cannot run off the track.
It causes the door to run perfectly true.
It cannot get out of order.
It is compact, Simple and Beautiful in design.

This Hanger will fit any ordinary rail, but our rail is preferable, from the fact that it has a double flange at the bottom, so that the screws will not work out and allow it to rock or tip over.

No. 1 Hanger, corresponding to 4, 5 and 6 in. Sheaves or Rollers.....per pair, $1 25
No. 2 " " 6 inch and upward..... " 1 50
One Dozen Pairs in each case.—dis 30 per cent.
RAIL, with Double Flange.....per foot, 7 cents.
200 *feet in each case.*—dis 30 per cent.

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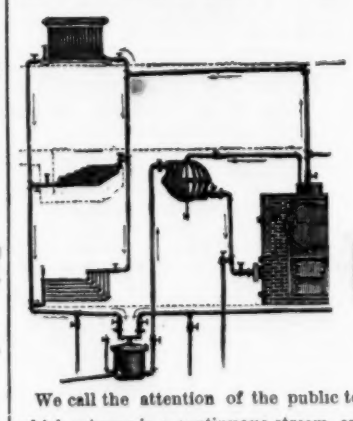
AUTOMATIC
STEAM TRAP WORKS.



C. A. PROUTY,

Inventor and Patentee.

Address,

Geo. W. Harrold,

ROCHESTER, N. Y.

We call the attention of the public to a novelty in the shape of an Automatic Steam-Trap, which returns in a continuous stream, and at a high temperature, the water of condensation, together with steam from the radiating pipes, to the boiler, below the water line. Keeping the pipes free from water prevents strain and leakage, and increases their radiating power. With this arrangement the engineer will find his labor materially lessened, since the same supply of water is converted into steam, condensed and returned to the boiler repeatedly, so that the loss of water is consequently very small, and an expensive pump is not required. This trap, which has been in operation for two years, is simple in construction and practical in application; there are no levers, weights, cranks, diaphragms or pistons to get out of order. It is self-operating, thus requiring very little attention, and will work with one radiator or twenty, only one size being needed. It is perpetual in its motion, and therein unlike other traps whose actions are spasmodic.

CENTENNIAL
SELF-LUBRICATIVE

Hemp Piston Packing

FOR

Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

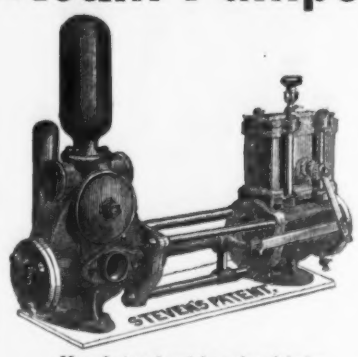
Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,
SOLE MANUFACTURERS,
Office, 1321 Fairmount Ave., Phila.

PATENT APPLIED FOR. Send for Circular.

DIRECT - ACTING

Steam Pumps,



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No auxiliary valves used. Direct connection between piston rod and valve movement. No knocking or jarring. Circulars and price lists sent upon application.

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Knitting Machines,

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NAPPERS FOR HOSIERY GOODS,

Stop Motions & Alarms for Knitting Machines,

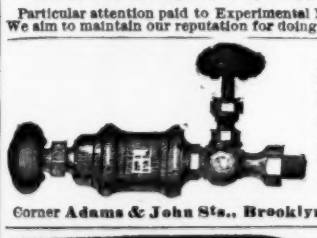
Flock Cutters, Flock Renovators and Mowing Machines.

EXTRA PARTS FURNISHED PROMPTLY.

☞ I am also prepared to furnish anything in the line of Gear Cutting from 5½ feet to ⅛ of an inch in diameter, any shape of tooth desired; Racks, Worms, Worm Wheels, Screws any size or number of threads to the inch, Wood Planing, Iron Planing, Large Lathe Work, Gear Cogging, Shafts, Hangings and Pulleys, also all kinds of Mill Work, Jobbing, and Machinery in general.

Shop, Foot of Cypress St., Troy, N. Y.

Particular attention paid to Experimental Machinery. We aim to maintain our reputation for doing work well.



CROSSLEY'S Patent Lubricator GLOBE VALVES, &c.

Corner **Adams & John Sts., Brooklyn, N. Y.**

Bennett Hotchkiss and N. C. Stiles' Patent.

This Drop (which has been illustrated in this journal as of that class in which the Hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we will only describe our improvements. The patents we are working under are those of BENNETT HOTCHKISS (who in an interference case with Goulding and Cheney was declared the first inventor) and N. C. STILES. Our improvements consist:

First.—Of an arrangement of parts that makes it the most complete Jobbing Hammer, and will take the place, to a great extent, of all other kinds for forging. In addition to the upright rod, which is operated by the hammer to open and close the rolls, we place another rod the lower end of which is secured to the end of a lever which is operated by the hand or foot, which operation also opens and closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not disturb the hand lever, thereby preventing the hand being injured, as otherwise would be the case.

Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps situated under the rolls, so arranged that as the hammer ascends they will freely open of themselves, but on descending they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.

Third.—The board or belt is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain *any hight* of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blows will be repeated until the pressure is removed. If a blow of less hight than the collar is set for is required, work the hand lever, which will give you any hight of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired hight, so that the next blow can be given from a state of rest, of less hight than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less hight than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.

The clamps in holding up the hammer keep the board from touching either roll and prevents the same from being worn uneven.

Manufactured only by the

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Wilkinson's.....11½c
Eagle.....11 cents currency—dis 15 @ 1 & 5 %
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Bates' Nut Augers.....dis 30&5 %
Douglass' & Ives' Augers.....dis 30&10 %
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Wrought Shutter.....dis 50 @ 50 & 5 %
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Shepard's " .....} Discount 50&10 % by the case
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Galvanized Pump.....₩ lb 15c
best Proof Coil Chain—
₩ lb.... 18½ 10½ 9½ 9 8¾ 8½ 8c gold
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Nicholson Mill Files.....new list
" Bastard..... "
" Taper..... "
Butcher's Mill.....$5 00 to £ gold
" Bastard.....5 00 to £ gold
" Taper.....5 00 to £ gold
Fluting Machines.
E. F. M.—4½ in. rolls, $5 50.....dis 10 %
" —6 in. rolls, $6 65.....dis 10 %
Mrs Knox—4 in rolls, $5 50.....dis 10 %
" —6 in. rolls, 6 65.....dis 10 %
Hammers.
Yerkes & Plumb's.....dis 15 %
Hammond & Son's.....dis 15 %
Verce.....dis 15 %
Hatchets.
Beaty's.....dis 15 @ 30 %
Shingling and Half. { ₩ doz..$7 00 7 50 7 25 8 00 / No..... 1 2 3 }
Yerkes & Plumb.....dis 15 %
Shingling and Half. { ₩ doz..$7 00 7 00 8 00 8 50 / No..... 1 2 3 4 }
Claw..... { ₩ doz.....$7 50 8 00 / No..... 1 2 3 }
Hinges.—Strap and T.....dis 40&10 %
Lull & Porter's Blind.....dis 40&10 %
" " by the case dis 50 %
Clark's Mortise Blind.....dis 40 %
Horse Nails. Nos. 6 7 8 9 10
Ausable..... 27 26 24 23 22
Globe..... 28 26 25 24 23
Brundage..... 26 24 23 22 21
Nos. 5 6 7 8 9 10
Putnam..... 32 28 26 25 24 22
On Ausable, Globe and Brundage 1000 ₩ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.....dis 45 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 50 %
Scandinavian Pad Locks.
₩ doz.....$10 50 10 50 12 00 12 00 15 00 15 00 }
No..... 9 9¾ 10 10½ 11 11½ } dis 15 %
₩ doz.....$18 00 18 00 22 00 22 00 }
No..... 12 12½ 13 13½ }
Trunk Locks.....dis 5 @ 10 %
Thumb and Roggens Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil.....dis 10 %
" " Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Mattocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 60 @ 60&10 %
Lincoln's " .....dis 40 @ 40&10 %
Landers, Frary & Clark's Petroleum...dis 10 @ 10&10 %
Taylor's Petroleum Faucets.....dis 20 @ 20&10 %
Brass Liquor Cocks.....dis 20&10 %
Meat Cutters.—Dixon's.....dis 15 %
Woodruff.....dis 15 %
Stowe.....dis 15 %
Hale's.....dis 25 %
Stuffers.....dis 10 %
Planes.—Auburn Tool Co.. "Bench".....dis 40 %
Second Quality.....dis 50 %
Metallic Plane Co.....dis 33½ %
Evans Pat. Circular.....net
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Picks.—Philadelphia.....net
Pittsburgh.....net
Plumbs and Levels.
Adjustable.....dis 60&10 %
Non-Adjustable.....dis 55&10 %
Rakes.—Cast Steel Garden.....dis 4 %
Malleable Garden.....dis 40 %
Wood Head Iron Teeth.....dis 40 %
Rules.—All Maker's Boxwood...dis 60&10 @ 60, 10&10 %
All Makers Ivory.....dis 50 %
Steelyards.—American Pattern.....dis 15 %
₩ doz.....$5 00 7 00 9 00 1 00 11 00 12 00
No..... 50 100 150 200 250 800
English Pattern.....dis 15 %
₩ doz.....$7 00 8 67 10 67 12 67 14 67 16 67
No..... 50 100 150 200 250 800
L. F. & C. Excelsior.....dis 10 %
₩ doz.....9 00 10 00 12 00 16 00 18 00 21 00
No..... 50 100 150 200 250 800
Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₩ doz. $10 50 net
Golden Clipper No. 10, Boxed and Sharp'd.₩ doz $11 50
Green " " " " " 9 50
Ormmon Scythes.....₩ doz $7 50 @ 9 00
Squares.—Steel and Iron, new list.....dis 50 %
Saws.—Disston's Cross Cut.....dis 15 %
Disston's Hand.....dis 12½ %
W. McNiece's H'd. Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list.....dis 40 %
" Champion.....dis 45 %

Shovels and Spades.
Rowland's Plain Back, Jan. 23d.....dis 25 %
" Back Strap " .....dis 25 %
Oliver Ames & Sons.....new list dis 12½ %
Brady Shovel Co.....dis 12½&5 %
Sad Irons.—Richmond (polished face).per lb. 8½c. net
Richmond (polished face)... by the cask " 8½c. net
Stone.—Arkansas Oil, No. 1.....₩ lb $1 25
Turkey Oil, No. 1..... " 1 00
Washita Extra..... " 80c
" No. 1..... " 22c
" " 2..... " 18c
".....dis 50&10 %
Screws.—Iron.....new list, Jan. 1st, 1874, dis 52½ %
Brass.....dis 52½ %
Spoons.—
Plated.....dis 40 %
Britannia.....dis 50 %
German Silver.....dis 50 %
" Light.....new list dis 35 %
Lalance & Grosjean Iron.....dis 10 %
Springs.—Gray's Door.....dis 40 %
Torry's Door.....dis 40 %
Stocks and Dies......dis 15 %
Stove Polish.—Gem.....₩ gross, $5 00
Onyx..... " 9 00
Try Squares.—Winterbottom.....dis 10 @ 15 %
Stanley Rule and Level Co.....dis 45&10 %
Willis Thrall, No. 2.....dis 30&10 %
Disston's No. 2.....dis 40 %
Tacks, &c.—Half Weight Tacks.....dis 72½ %
" " by the case...dis 72½&7½ %
Clout and Finishing Nails.....7½ %
" " by the case.....dis 7½ %
Traps.—Genuine Oneida—Newhouse list.....dis 30 %
Imitation " " .....dis 30 %
Vises.—Solid Box.....₩ lb. net 15c
Wrenches.—Coes Genuine.....dis 40 @ 40&5 %
Coes Imitation Wrought Bar.....dis 50 %
" " Malleable Bar.....dis 60 %
" " (Kellogg) Malleable Bar....dis 50 @ 10 %
Tafts Pattern (Wrought Bar).....65 %
" " Kellogg's (Nail Bar).....dis 65&10 %
Philadelphia Tool Co.'s Pat. Duplex.....dis 25 %
" " " Improved Baxter.....dis 25 %
" " " Adjustable Fork.....dis 25 %
Wire.—No. 0 to 18.....dis 45 %
No. 19 to 26.....dis 47½ %
No. 27 to 36.....dis 45 @ 47½ %
Coppered 0 to 12.....dis 15 @ 20 %
Tinned Broom Wire.....dis 25 %
Galvanized Wire No. 0 to 18.....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

February 8, 1875.

Augers—Snell Mfg. Co.....dis 25 %
Bits, Auger—Snell Mfg. Co.....dis 25 %
Bells, Cow—Yaw's Genuine.....dis 30 %
Bolts—Carriage and Tire.....dis 75&10 %
Braces—Bit, Spofford's Patent.....dis 50&10 %
Brads, Cut.....dis 50&7½ %
Boards—Stove, Brooks' Patent.....dis 30 %
Butts—Brass.....dis 30 %
Wrought Narrow.....dis 30&10 %
" Broad, Loose Joint.....dis 35&10 %
" Table and Back Flaps.....dis 30&10 %
Wrought Butts, Loose Pin.....dis 35&10 %
Belting—Rubber.....dis 30 @ 35 %
Leather, new list, oak tanned.....dis 20 %
Brick—Bath (box of 2 doz) Best English.....$1 25
" Rutherford".....$1 00
Cases—Parlor Coal Hod.....dis 10 %
Chalk—White, Carpenter's.....₩ gross, 63c
Red, Carpenter's " 90c
Blue, " $1 17
Chisels—Firmer Socket.....dis 60&10 %
Framing Socket.....dis 60&10 %
Corner Socket Chisels.....dis 60&10 %
Slick's Carpenters'.....dis 60&10 %
Castings—Malleable.....₩ lb 10c
Clothes Wringers, "Novelty" No. 2.....₩ doz $65 00
Elbows—Corrugated..... 5 5½ 6 7 } dis 10 %
Charcoal..$3 50 4 00 5 25 6 50 }
Russia..... 7 00 9 50 12 00 14 00 }
Files—Maischoss Bros.....dis 50 %
Fluters—Geneva Hand.....₩ doz. $15 00
Freezers Ice Cream—" Champion".....dis 30 %
Hammers—Henry W. Kip's.....dis 7½ %
Hinges—Window Blind—
Clark's.....dis 55&10 %
Shepard's and Standard.....dis 55&10 %
Wrought Strap and T.....dis 35&10 %
Hods, Coal—Plain Black and Galvanized.....dis 10 %
Funnel, Black and Galvanized.....dis 10 %
Fancy and Helmet.....dis 10 %
Hooks and Staples—Wrought.....dis 70&10 %
Hooks—Belt.....dis 50&10 %
Hasps and Staples—Wrought.....dis 70&10 %
Mad Irons.....8½c
Kettles—Brass.....₩ lb. 45c
Enameled.....dis 50&10 %
Knives, Drawing—Oval No. 1.....dis 60&10 %
Razor Blade.....dis 50&10 %
Lanterns "Peerless"..... No. 1 5 10
₩ doz $36 00 $10 50 $18 75 dis 10 %
Tubular " with Guards.....
Machines—Apple Paring, "Turn Table".....$5 00 ₩ doz
Mills, Coffee—Box and Slide, common.....dis 15 %
Box Union and Eagle.....dis 15 %
" American.....dis 30 %
Nails—Clout and Finishing.....dis 7½ %
Shoe.....dis 7½ %
Horse, Ausable..... No. 5 6 7 8 9 10
80 70 25 24 25 22c
" " Pointed & Polished.....add 1c ₩ lb
" " 1000 lbs.....dis 5 %
" Clinton..... No. 5 6 7 8 9 10
21 19 18 17 16c
Packing—Rubber.....dis 30 @ 35 %
Pencils, Slate—Soapstone.....4 5 6in.
50 40 50c. ₩ 100
Case lots.....dis 20 %
Paint—White Lead, U. S. Gov't.....dis 25 %
Rivets—Iron, Black and Tinned.....dis 25&7½ %
Rope—Manila, ½ inch and larger.....₩ lb 14½c
Sisal, ½ inch and larger.....11½c
Jute, all sizes.....9½c
Screws—"American Screw Co"—
Flat Head, Iron.....dis 52½ %
Flat Head, Brass.....dis 52½ %
Spoons, Iron Tinned.....dis 2 %
" by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 40, 10&5 %
Britannia.....dis 45&10 %
Squares—Steel and Iron.....new list 50 %
Saws—Henry Disston & Sons.....dis 12½ %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Stove Polish—Gem.....₩ gross, $4 50
" Dixon's..... 6 00
Traps, Steel—Newhouse.....dis 20 %
Tacks—Half Weight Am. Iron.....dis 72½&7½ %
Vises—Palace Coal.....dis 10 %
Vises—Parallel, Buffalo.....dis 25 %
Ware—French, Tinned and Iron.....dis 25 %
Stamped and Japanned.....dis 5 %
Cast Iron Hollow.....dis 33½ %
Tin Plates.—Add for each X..... 2 00
10x14, IC. Charcoal...$ 2 00, 14x20 C. terne.....$11 00
12x12, " ... 12 00 20x28 C. " 22 00
12½x17, " ... 15 00 20x28 X. " 37 00
14x20, " ... 15 00
Pig Tin—Straits.....28c @ 29c
Bar Tin.....30c
Solder.....No. 1, 16½c ; No. 2, 15½c
Sheet Zinc—
" Lasalle".....570 ₩ lb 100 ₩ casks
$10 75 11 00 ₩ 100 ₩s
Sheets.....$11 25
Iron Wire—Bright and Annealed.....dis 40 %
Coppered.....dis 35 %
Tinned.....dis 15 %
Tinned Broom, } Nos. 20 21 22 }
} 20c 21c 21c } .....dis 25 %
Copper—Sheathing 14 @ 18 oz.....₩ lb 31c
Planished.....₩ lb 36c @ 38c
Bottoms.....₩ lb 32c
Bolts.....₩ lb 33c
Braziers' Sheets.....₩ lb 43c
Sheet Iron.—
18 Common.....$4 70
24 Common.....5 00
24 W. D. Wood & Co., Smooth Finish.....5 20
Am. Russia..... A. B.
14c 11c
Gen. Russia, No. 1 stained.....15c
" " clean.....19c
Galvanized.....dis 30 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal.....$11 50 @ 12 00
I. X. 10x14 Charcoal..... 14 50 @ 15 00
I. C. Terne 14x20..... 10 00 @ 10 25
I. C. Terne 20x28..... 21 50 @ 22 00
I. C. Continuous..... 24 00
Block Tin.—Pig.....₩ lb 27c @ 29c
Solder—
S. & Co.....₩ lb 23c
Lead.—Pig.....₩ lb 7½c.
Copper.—
Ingot.....₩ lb @ 24c
Planished..... " @ 34c
Sheathing..... " @ 33c
Copper Drops " @ 32c
Zinc. Cast, 500 to 1000 lbs.....₩ lb
Case, 100 lbs..... "
Slab..... "
Brass.—
Roll, No. 6 to 10.₩ lb 30c
" 20 to 28. " 32c
Babbit Metal.—
Sellew & Co.....₩ lb 35c
Antimony.....
Bismuth.....
Nickel.....
Sheet Iron.—
Gen. Russia.....₩ lb 20c

	Bars	₩ lb	21c
	A I	" lb	19c
	Roofing	"	17c
	Bar	" lb	8½c
	Sheets, 6 to 9 lb	₩ lb	33c
	" 10 to 12 oz	"	35c
	Braziers 12 lb	"	32c
	Copper Bottoms	"	34c
		"	10½c
		"	11 c
		"	7½c
	Roll, No. 38 to 40	₩ lb	50c
	Wire, No. 0 to 20	₩ lb	35c
	" 20 to 26	"	40c
	Aliens'	₩ lb	20c
	Market	"	12c
		₩ lb	17c
		₩ lb	$4 00
		₩ lb	33 ½0
		₩ lb	15c

	Planished A	₩ lb	12½c
	" B	"	12½c
	Smooth		Smooth
Com. B.	Fin. S. I. U.		D Re'fd.
18 to 20	4½c	5½c	7½c
22 to 24	4½c	5½c	7½c
26	4½c	5½c	7½c
27	5½c	6½c	7½c

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal
IC. 10x14.....$12 00
IX. 10x14..... 14 75
XX. 10x14..... 17 50
IC. 12x12..... 12 00
IX. 12x12..... 15 25
IC. 14x20..... 18 00
IX. 14x20..... 18 75
XX. 14x20..... 18 50
XXX. 14x20..... 21 25
XXXX. 14x20..... 24 00
DX. 100 Plate..... 13 25
DX. " 14 25
DXX. " 17 00
DXXX " 19 75
DXXXX 100 Plate.. 22 50
IX. 14x14..... 24 00
IC. 10x14 W..... 11 00
IX. 10x14 W..... 13 75
Roofing Tin.—Best Charc.
IC. Terne, 14x20.....$11 00
IX. " 14x20..... 13 75
IC. Terne, 20x28..... 18 00
IX. " 20x28..... 25 00
Coke Tin.—
IC. 10x14 Coke.....$10 25
IX. 10x14. Coke..... 13 00
IC. 14x20. " 11 25
Sheet Zinc.—
Any width.....11c

Copper.—
Sheathing.....32c
Copper Bottoms.....34c
Planished Copper.—
Sheathing, 14x48.....33c
Boiler Size, No. 7.....40c
" " No. 8.....40c
" " No. 9.....40c
Pig Tin.—
Large Pigs.....26c
Small Pigs.....25½c
Bars.....27c
Solder.—No. 1.....16c
No. 2.....15c
Bright Wire....dis 40 %
Sheet Iron.—
No. 18 Am. Com.....4 50
No. 24 Am. Com.....5 00
Patent Am. Russia "A" Nos. 24, 25 and 26....14c
Russia, No. 9, 10, 11&12.....18c
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $6 10
" 21 to 24..... 6 30
" 25 & 26..... 6 60
" 21 to 24 Char'l.. 7 80
" 25 & 26 " .. 8 00

Steel.

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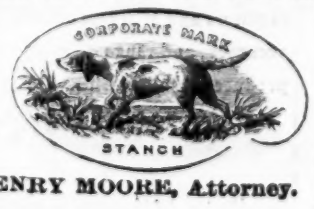

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DARNALL WORKS, ATTERCLIFFE FORGE, } SHEFFIELD, ENGLAND.

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Plow Wings, Shares, Cultivators, Reaper Bars, ow Bars, &c., &c.

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CHICAGO.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)

Tin Plate.—

10x14, IC, Ch'l. Good	$	14x20, IX, Ch'l Best	$15 50
10x14, IC, " Best	12 00	14x20, IXX, " "	18 00
10x14 IX, " "	14 50	14x20, IXXX, " "	20 50
12x12, IC, " "	12 50	DC, 100 Plate, " "	12 00
14x12, IX, " "	15 00	DX, " "	14 50
14x20, IC, " "	13 00	DXX, " "	17 00
Roofing IC, Charcoal, Best		DXXX, " "	19 50
Roofing IX, Charcoal "			11 50
20x28, IC, Charcoal Roofing,			14 00
20x28, IC, "		Com	22 00
20x28, IC, "		Fair	22 50
20x28, IC, "		Best	23 00
20x28, IX, "		"	27 50
10x14, IC, Coke Plates			10 00 @ 10 50
14x20, IC, "			10 50 @ 11 00
10x20, IC, "			16 50

Block Tin.—

Large Pigs	30c	Bars	32c
Small "	31c	Straits, 2c. higher.	

Zinc.—Sheet, 500 to 1000 lb. Casks 10¾c
Loose Sheets 10¾c
Slab Zinc or Spelter 6¾ to 8c

Copper.—Bottoms 35c
Sheathing 33c
Planished 38c
Boiler lengths 40c
Ingot 24c to 26c
Bolt 40c

Braziers' Sheets.—

30x60, 6 to 10 lbs.	₩ lb 41c	30x60, 15 to 100 lbs.	₩ lb 22c
30x60, 10 & 12 lbs.	" 38c		

Solder.—F. S. & Co.'s make.

Best Fine	22c	Roofing	18c
No. 1	20c	Braziers' or Spelt. Sold.	25c
		No. 1	18c

Antimony 14c
Babbit Metal—F. S. & Co.'s 16c
No. 2 14c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata.
No. 24	5 c	7¼c	9¼c	
22 & 26	5¼c	6¼c	8 c	10 c
27	5½c	6¾c	8 c	10 c

Galvanized Iron dis 20 %

No. 16 to 20	12c	No. 27	16c
21 to 24	13c	28	16c
25 & 26	14c		
		No. 1 Stained	19c
		In sheets, 1c. higher.	

Russia Iron.—

Perfect	30c	B	10½c
		In sheets, 1c higher.	

American Russia.—

A	15c	Lead Pipe, in full coils	8¼c
		Lead Pipe, when cut	8¾c

Lead.—

Pig	7¼c	Sheet Lead	8¾c
Bar	8¼c		

Wire—Bright dis 35 %
Coppered dis 30 %

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz.)

Tin Plates.—₩ box

I. C. Char. 10x14	@ $11 50		
I. C. C. ake 10x14	" 9 00		
Char. Roof. IC, 14x20, 10 75			
Coke " IC, 14x20, 10 25			

Pig Tin.— ₩ lb

Banca	31c	Sheet & Pipe	34c
Straits	29c		
English	24½c		

Zinc.—Sheet ₩ lb 11c

Iron.—Sheet Iron, Russia " 17½
Sheet Iron, English " 8
" " American Refined " 5½c
" " Galvanized " 10c
Plate Iron " 5½c
wedish and Norway Bar Iron, gold ₩ ton, $120 00
" " " Shapes, gold 125 00
Norway Nail Rods, first quality, gold " 145 00
" " second " " 135 00
Best Refined Bar Iron " 62 50
The "Burden Best" Iron " 100 00
American Pig Iron, Foundry, No. 1, x " 20 00
" " " No. 2, x " 27 00
" " Gray Forge " 24 00
Scotch Pig Iron ₩ ton 36 50 @ 40 50
Wrought Scrap Iron " 35 00

Steel.— ₩ lb

Eng. Tool	18c	German	10c
American Tool	14¾c	Spring	8 c
" Mach	10c	Tire	6¾c
Bessemer	7¾c	Sleigh Shoe	4¾c
		Toe Calk	8 c

Copper.—

Sheathing	33c
Bolt	38c
Ingot	34c

Lead.— ₩ lb

Pig	6¾c
Sheet & Pipe	8½c

Spelter ₩ lb 8c
Antimony ₩ lb

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror ₩ doz, $8 50
Hudson's Rotary " 9 00

Axes.—Wm. Manns, Red Warrior ₩ doz $11 50
Wm. Manns, W. Stewart's " 11 00
" Handled " $5 extra
" Double Bitted " 21 50
H. L. B. & Co.'s, L. & Co. " 11 50
" " Pioneer "
" " James & Co. " 11 00
Hunt's " 12 00

Axles.—Kritch & Crane Mfg. Co.'s—
Patent Taper Axles, Swelled Taper, Concord and Red Jacket Axles dis 12½ %
Common Axles, 1¼ inch and upward ₩ lb 5¼c
" " less than 1¼ inch " 5¾c

Bellows.—Best St. Louis make ..60c ₩ in. dis 15 %

Bells.—Troy, Church, School and Farm Bells ₩ lb 48c

Bolts.—Arms, Bell & Co.'s Carriage and Tire dis 75 %
Arms, Bell & Co.'s Machine dis 30 %

Butts.—Western Butt Co.'s—
Narrow Fast Joint dis 33 %
Broad Fast Joint dis 50 %
" Loose " dis 65 %
Reversible " dis 60 %
" Japanned and Silver Tipped dis 55 %
Loose Joint " Acorn " " dis 60 %

Corn Cutters or Hooks.—Solid Steel ₩ doz $4 00

Corn Knives.—Dunn E'ge T'th Co.'s Clip " 3 75
Seymour Mfg. Co.'s Solid Steel Back " 3 00

Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers dis 10 %
Hand Shellers Special rates

Cotton Gins.—Dubois Patent dis 10 %

Crow Bars.—Steel Pointed ₩ lb 7c

Drag Saw Machines.—
Culver's Iron Drag Saw dis 10 %
Robinson's Patent Sweepstakes Drag Saw dis 10 %

Fanning Mills.—Nash & Cutt's dis 15

Feed Cutters.—Burdick's National dis 15 %
Baldwin's American dis 15 %
Sanford No. 1, $12 00; No. 2, $8 75 net

Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks dis 33⅓ %
" " Handled Hoes dis 33⅓ %

Grinding Mills.—French Burr Mills net list
Challenge Feed Mills dis 20 %
Sedgebeer's Nonpareil Mills dis 10 %
Osage Corn and Cob Mill dis 20 %

Hammers.—Masons' Hammers ₩ lb 20c
Smiths' Hand 28c

Handles.—No. 1 Fork, Hoe and Rake dis 20 %
No. 2 Fork, Hoe and Rake dis 40 %

Harrow Teeth.—1 inch iron ₩ lb 4½c
⅞ and ¾ inch iron " 4¾c
Barbed or Headed ½c extra

Hay and Cotton Presses.—
Dederick's Railroad dis %
" Perpetual net

Hay Knives.—
Dunn Edge Tool Co.'s ₩ doz $15 00—dis 15&5 %
Lightning (Weymouth's Patent) ₩ doz $30 00

Horse Hay Fork.—Nellis' Harpoon dis 25 %

Horse Nails.—National Patent Pointed 20c rates
National Patent Pointed, extra finished 22c

Horse Powers.—Pitts or Carey's Patent dis 10 %
Wheeler's Railway dis 10 %
Sandwich Lever dis 10 %

Horse Rasps.—Heller Bros. dis 45 %

Horse Shoes.—
Rhode Island (Perkin's Pattern) ₩ keg, $6 50
" Mule " 7 50
" Trotting Shoes " 9 00

Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks ₩ doz $14 75 @ 15 25
" Grub Hoes, oval eye " 10 75 @ 12 00

Nails.—Wheeling $3 30 rates

Picks.—Klein, Logan & Co.'s Railroad and Clay ₩ doz $10 50 @ 11 75
Klein, Logan & Co.'s Coal " 8 00 @ 9 00
" " Poll 12 00
" " Stone 15 00
" " Tamping 17 50

Plows.—Avery's Cast and Steel dis 15 %
Collins Cast Cast Steel new list net
Pekin Steel new list net

Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $32 dis 30 %

Rakes.—Paddock's Premium Sulky $30 00 net
St. Louis Revolving 14 tooth 5 50 net
16 " 6 00 net
" Hand Hay Rake dis 10 %

Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives dis 20&5 %
" " Sections dis 25 %

Road Scrapers.—Steel dis 25 %
Cast Iron dis 10&2½ %

Sad Irons.—Monitor Brand, Silver Polished ₩ lb 4½c

Sash Weights.—Standard Solid Eyes ₩ lb 3½c

Saws.—Hubbard, Lippincott, Bakewell & Co.'s dis 10
Branch, Crooks & Co.'s dis 15

Scythes.—Dunn Edge Tool Co.'s new list dis 25

Scythe Stones.—No. 1 Indian Pond ₩ gr's, $7 00
Extra Indian Pond " 7 50
Premium " 10 50 dis 25
Diamond Grit " 13 00

Shovels and Spades.—Myers & Armor dis 15 %
Grain Scoops, (Pat. Corrugated Straps) M. & A. dis 15 %
" " T. Rowland's dis 15 %

Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished ₩ lb, 15c
Solid Cast Steel " 25c

Spaths and Cradles.—Seymour Mfg. Co.'s dis 20 %

Springs.—Cleveland Spring Co.'s—
Carriage and Express dis 12½ %
Blue Seat Springs dis 15 %

Thimble Skeins.—Pump & Skein Co.'s dis 60 %

Vises.—Solid Box ₩ lb 16c
Wilcox Mfg. Co.'s dis 15 %

Wheelbarrows.—Railroad & Garden new list net

Wrenches.—Coes' Genuine dis 33⅓ %
Coes' Pattern dis 50 %

Wringers.—Crown ₩ doz $40 00

Wagons.—Whitewater Farm Wagons—
Thimble Skein No. 3, $80; 3½, $84; 3½, $88
Iron Axle No. 1½, $85; 1¾, $90; 1¼, $95

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sallew & Co.)

Tin Plate.

IC, 10x14, Char	12 00 @ 12 50	IX, continuous, 20 in. x 200 ft	
IX, 10x14,	" 15 00	IC, 10x14, best	
IC, 12x12,	" 13 00	Coke	$11 50
IX, 12x12,	" 15 50	IC, 10x14, good Coke	11 00
IC, 14x20,	" 13 50	IC, 10x20	17 50
IX, 14x20,	" 16 00	IC, 14x20	11 00
IC, 14x20, Tern.	11 75 @ 12 00	IC, 20x28, Coke Lead	8 50
IX, 14x20,	" 14 50	IX, 20x28, punch'd for Safes	11 00
IC, 20x28,	" 23 00 @ 24 00		
IX, 20x28,	" 27 00 @ 28 00		
IC, continuous 20 in. x 200 ft			

Block Tin.

Large Pigs	Straits 30c	Bars	32c
Small "	English 31c		

Sheet Zinc.

Casks	₩ lb 10¼c	Sheet	₩ lb 11¼c

Solder.

No. 1, Refined, in bars or plate	17c
No. 2, " " "	16c
Pig Lead	7¼c

Sheet Copper—18 to 100 lbs. Sheets 30x60 32c
14 to 16 lbs., Sheets 30x60 32c
10 to 12 lbs., " and 30x72 30c
6 to 9 lbs., " 38c
Tinned, 14 and 16 oz. 14x48 33c
Planished, 14 and 16 oz. 14x48 38c
" No. 7, 8 and 9 40c
Copper Bottoms 40c

Sheet Iron.—

	Com'n.	Sm'th.	Char l.	Juniata
No. 16 to 20	4¾c	5 c	7c	9¼c
No. 22 to 24	4¾c	5 c		
No. 26	4¾c	5¼c	7¾c	9¾c
No. 27	5 c	5¾c	7¾c	10c

Galvanized Iron dis 22½ %
Iron Rivets dis 35 %
Iron Wire dis 35 %
Coppered Market Wire dis 30 %
Copper Rivets and Burs dis 25 %
Russia Iron.—Nos. 9, 10, 11 and 12. ₩ lb 20c
No. 1 stained, ₩ lb 16c
Imitation Russia, ₩ lb 13
Retinned Stamped Ware dis

TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

ShiveGovernorCo

BETHLEHEM, PA.

ALSO,

SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR.

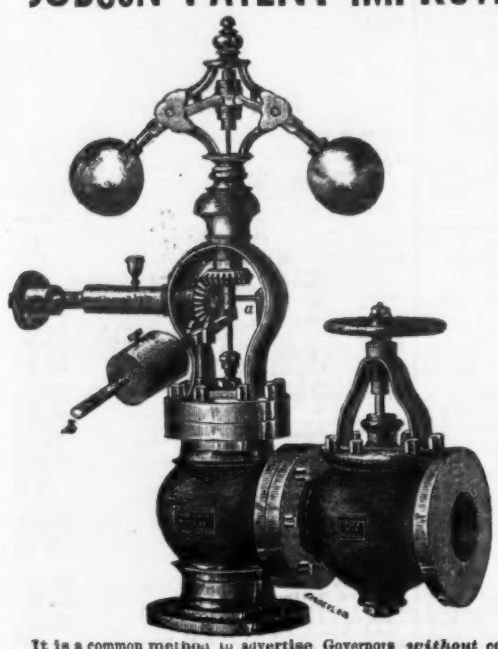
The Best and Cheapest Watcher of the Watchman made

PRICE ONLY $15.

Circulars sent free.

February 10, 1875. REDUCED PRICE LIST OF THE

JUDSON PATENT IMPROVED GOVERNORS.



☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Black, Finished or Portable, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.

Capacity of Valve or Diameter of Steam Pipe in inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
¾	18·00	20·00	17·00	..	..
¾	20·00	22·00	19·00	..	..
1	24·00	27·00	22·00	2·00	5·25
1¼	29·00	32·00	27·00	2·25	6·65
1½	34·00	38·00	31·00	2·50	8·50
2	41·00	46·00	38·00	2·75	11·50
2¼	47·00	54·00	..	3·25	16·00
2½	50·00	57·00	47·00	3·50	17·00
2¾	55·00	62·00	..	3·75	19·00
3	62·00	70·00	..	4·25	22·00
3¼	71·50	80·00	..	4·50	27·00
4	81·00	92·00	..	5·00	32·00
4¼	91·00	103·00	..	5·50	37·00
5	103·00	114·00	..	6·00	42·00
5¼	116·00	129·00	..	6·50	48·00
6	134·00	148·00	..	7·00	55·00
7	160·00	176·00	..	8·00	69·00
8	199·00	219·00	..	9·00	83·00
9	230·00	255·00	..	10·00	..

Portable made larger than 2¾ in. not

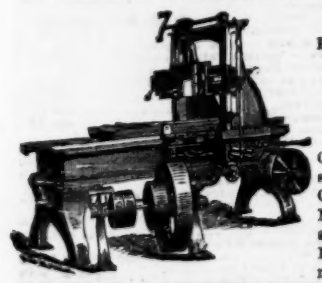
No Charge for Boxing & Cartage.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Pratt & Whitney Co.,

Hartford, Conn.,



Have constantly on hand and making

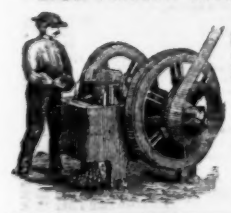
Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

BLAKE'S PATENT

STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect MCADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for: using **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

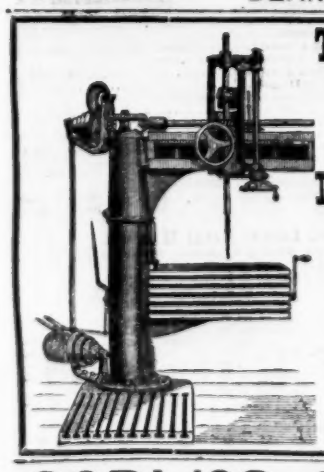
For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

THORNE, DeHAVEN & CO.

21st Street, above Market,

PHILADELPHIA.



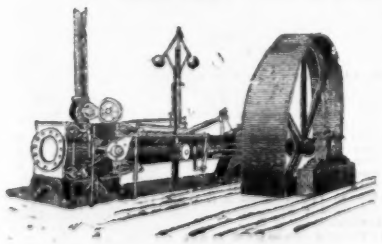
DRILLING MACHINES,

PORTABLE,
RADIAL,
MULTIPLE,
VERTICAL,
HORIZONTAL,
SPECIAL,

CORLISS STEAM ENGINE.

The Best in the World for Economy in Fuel and Cost of Running.

BUILT BY



Robert Wetherill & Co.,

Chester, Pa.,

Engineers, Machinists, Founders,

And BOILER MAKERS.

Stationary Engines, Shafting, Mill Gearing, Hoisting Machines, Improved Piston Packing and Machinery.

Special attention given to boring Ports and Cylinders.

A Written Guarantee given with our Pumps.

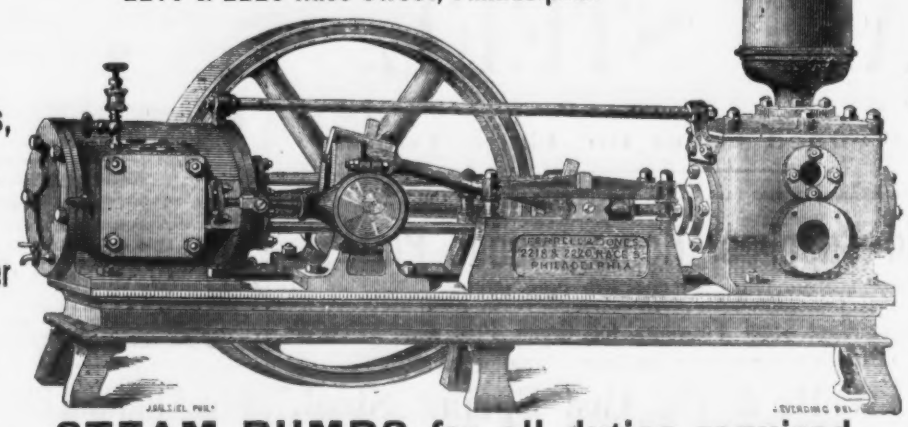
ENTERPRISE HYDRAULIC WORKS,

2218 & 2220 Race Street, Philadelphia.

Fan Blowers.

Piston Blowers,

"FOULDS" Patent Water Elevator.



Our Fly Wheel STEAM PUMP is admirable For Fire Purposes.

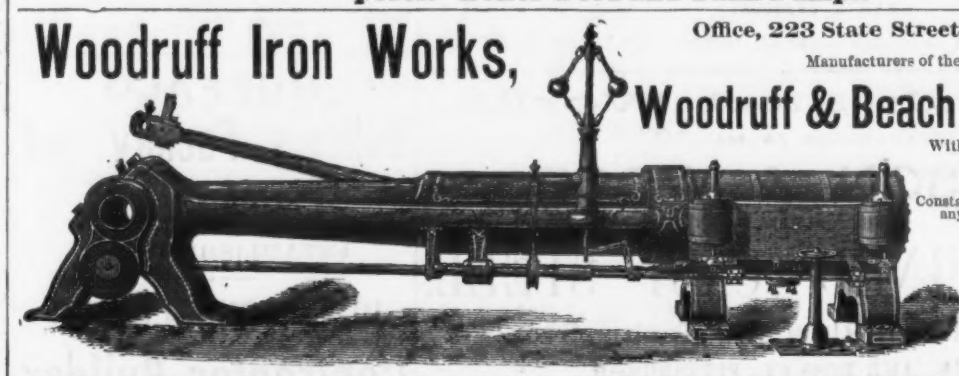
STEAM PUMPS for all duties required.

Centrifugal, Hand and Power Pumps, Special Double Plunger Pumps for Mining Purposes. Boiler Feed and Tank Pumps.

Woodruff Iron Works,

Office, 223 State Street, Hartford, Conn.

Manufacturers of the Celebrated



Woodruff & Beach Steam Engine,

With recent valuable improvements.

Steam Boilers

Constantly on hand and made to order any size or style. Special attention given to the manufacture of

MILL WORK

And all kinds of Machinery.

CASTINGS

Of any size or style. Direct all letters to **The Woodruff Iron Works, Hartford, Conn.**, as the Woodruff & Beach Iron Works and firm of Woodruff & Beach are both dissolved.

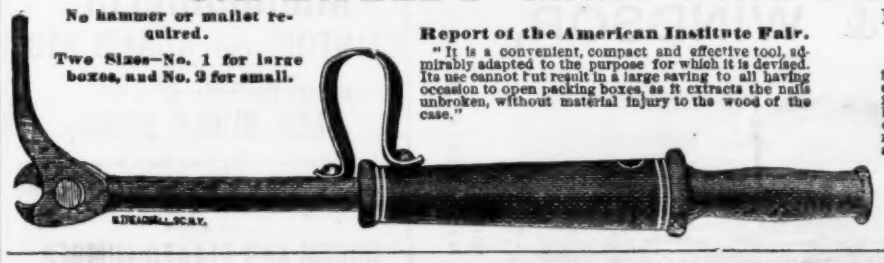
MALTBY, CURTISS & CO., Waterbury, Conn.,

Manufacturers and Sole Proprietors of

CAPEWELL'S GIANT NAIL PULLER.

No hammer or mallet required.

Two Sizes—No. 1 for large boxes, and No. 2 for small.



Report of the American Institute Fair.

"It is a convenient, compact and effective tool, admirably adapted to the purpose for which it is devised. Its use cannot but result in a large saving to all having occasion to open packing boxes, as it extracts the nails unbroken, without material injury to the wood of the case."

Reasons why you should Use the Nail Puller.

1st. The edges of the boxes are never split or injured. 2d. No broken Nails in the box or cover. 3d. The box and cover remain sound for future use. 4th. Nails are drawn without breaking or bending. 5th. The box can be opened in half the time required by the old method with chisel or crane. Send for prices, and other information, to

MALTBY, CURTISS & CO.,

Hardware Commission Merchants,

62 Reade St., N. Y.

UNION HARDWARE CO.,

120 Chambers and 50 Warren Streets, New York.

The most Convenient, Effective and Cheapest

NAIL EXTRACTOR

In the Market. Large Trade Supplied.

Knowles Patent Steam Pumps

MANUFACTURED BY THE

KNOWLES STEAM PUMP WORKS,

WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston, 92 & 94 Liberty Street, N. Y.

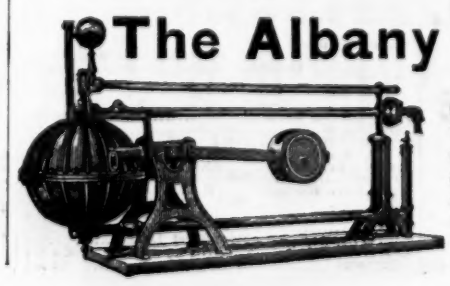
Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

FIRE PUMPS, a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.

The Albany Steam Trap.



This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

TOWNSEND & BLESSING,

Albany, N. Y.

Whittier Machine Co.,

1176 Tremont St., Boston, Mass.

Manufacturers of

STEAM ENGINES, BOILERS, ELEVATORS and MACHINERY.

This Company has just received **the highest award, a Gold Medal, for Safety Elevators**, from the Massachusetts Charitable Mechanics Association.

CHARLES WHITTIER, Prest. JAMES STURGIS Treas.

Patented Steam and Hydraulic, April 1, 1869.

EAGLE PACKING,

Of various sizes for **ENGINES and PUMPS**, manufactured by JAMES GLANDING & Co., No. 115 Queen St., Philadelphia. What the proprietors claim for the Eagle Packing: 1. Its general adaptation to all purposes for which packing is used. 2. Its durability. It will outlast any other article in use. 3. Its cheapness. It can be furnished to the consumer at a lower rate than any other packing

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JAMES HENSHALL,

Engineer, Machinist & Blacksmith,

1056 Beach St. PHILADELPHIA.

Drawings made to order. Repairing of all kinds promptly attended to. Blacksmithing executed in all its branches.

Machinery, &c.

ANDREW WATSON,
MACHINIST and ENGINEER,
Nos. 537 & 539 Dickinson Street,
Near Trenton Avenue, 19th Ward, PHILADELPHIA.

Builder of ***Vertical Steam Engines and Boilers,*** peculiar for their economy of space and fuel, safety and quickness in raising Steam. Also, sole manufacturer of ***Improved Balance Governor*** with automatic stop, ***Balance Slide Valve, Safety Valves, Stop Valves, Improved Pistons for Engines,*** which require no setting by the Engineer. Engine Builders and Dealers supplied with ***Governors, Stop Valves, Safety Valves, &c., &c.*** These governors are fitted up in the very best manner, with brass Valves and Seats, which will not corrode or stick fast. Guaranteed to regulate under any irregular load which an Engine is subject to. Millwright work executed, and Machinery in general satisfactorily repaired.

Engines Indicated Promptly and with the Greatest Accuracy.

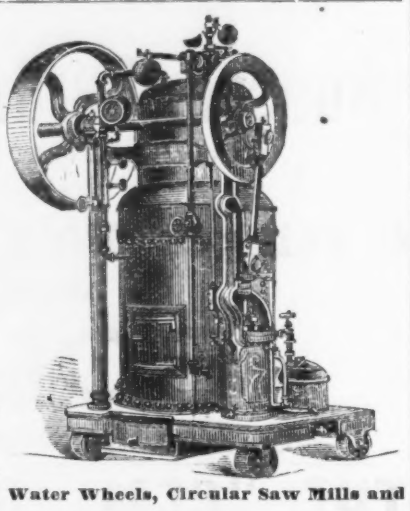
Ludlow Valve Mfg. Co.,
OFFICE AND WORKS:
938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,
VALVES
(Double and Single Gate, ¾ in. to 48 in.—outside and inside Screws, Indicator, &c.)
for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

THE
Shapley Engine
Patented Feb. 10, 1874.

COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.
$200·00.
Cheaper than any Engine offered of the same capacity.

MANUFACTURED BY
SHAPLEY & WELLS,
Binghamton Iron Works,
Binghamton, N. Y.



Manufacturers of **Steam Engines, Boilers, Water Wheels, Circular Saw Mills and Mill Work generally.**

FAIRMOUNT MACHINE WORKS,
Office, **2106** WOOD St., Philadelphia.
Manufactures as Specialties
POWER LOOMS,
SPOOLING, BEAMING, DYEING and Sizing Machines.
PATENT BOBBIN WINDING MACHINES
wind direct from hank or skein to shuttle bobbin.
SHAFTING
With Patent Adjustable self-oiling Bearings.
Adjustable Self-Oiling Hangers,
8, 10, 12, 15 and 18 in. drop,
Ball and Socket Self-Oiling Pillow Blocks.
Pulleys, from 4 inch to 10 feet in diameter.
Pulleys made in two parts, any size required.
SELF-ACTING WOOL-SCOURING MACHINES,
LARD AND PARAFFINE OIL PRESSES.
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Machine and Foundry Work in all their branches.
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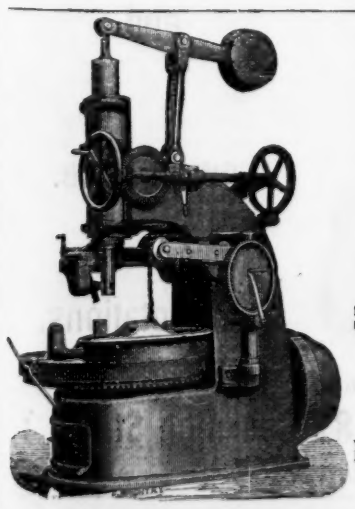

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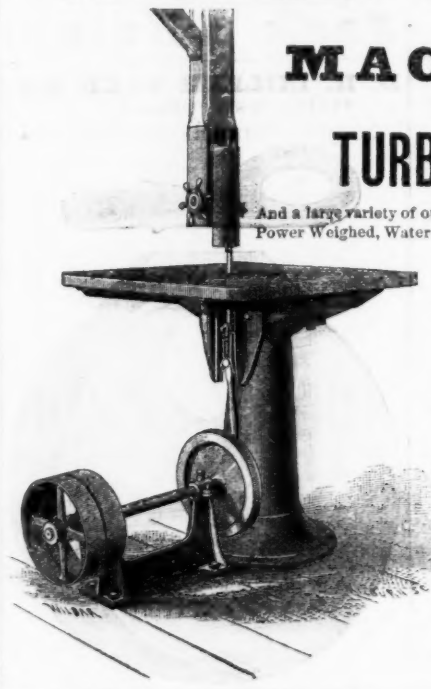

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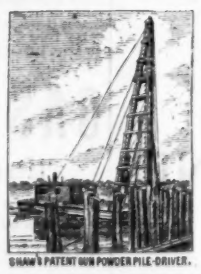

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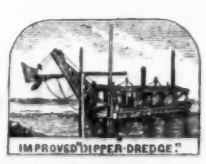

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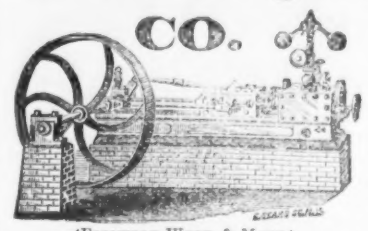

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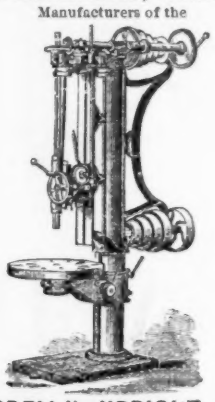

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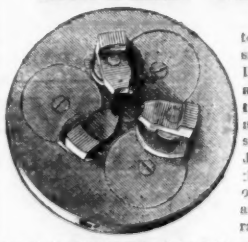

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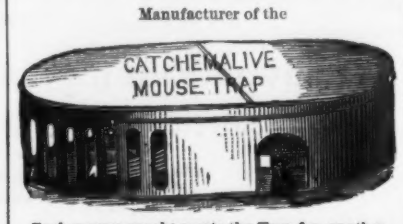

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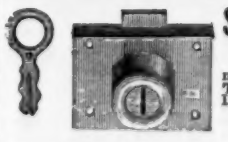

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